

ATTACHMENT 1

BORING LOGS AND WELL CONSTRUCTION LOGS



Waste Management, Inc.

ROCK BOREHOLE LOG

WELL GMW-1

See Plate 3
for Location**SITE NAME AND LOCATION**

Gregory Canyon, near Pala, California

BORING NO.

GMW-1

DRILLING METHOD: Air Rotary/Mud Rotary**SHEET**

1 OF 3

HOLE DIAMETER: 10-inch (0 to 48 feet)

5-inch (48 to 54 feet)

DRILLING

4.25-inch (54 to 90.5 feet)

WATER LEVEL

21.25

22.48

START**FINISH****TIME****TIME****DATE**

8-13-90

9-5-90

DATE**DATE**

DATUM: M.S.L.

ELEVATION: 331.36

CASING DEPTH

48.0

8-7-90

8-10-90

DRILLING: Mobile B-61XD Rotary w/Christensen Coring

SURFACE CONDITIONS: Soil & Boulders

ANGLE: Vertical

Note: Reference measurement points for lithology from

SAMPLE HAMMER TORQUE: Not Applicable

ground surface; water levels from top of casing in feet

DEPTH IN FEET	PERCENT RECOVERY	CORES				SOIL DESCRIPTION OR ROCK LITHOLOGY	SYMBOL	OBSERVED ROCK STRUCTURE(S)	SAMPLER AND BIT	CASING TYPE	BLOWS/FOOT ON CASING
		RUN NO.	NO. OF CORE-PIECES LARGER THAN 2X CORED DIAMETER	RECOVERY	ROD						
5	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	ALLUVIUM (Qal ₃) Contains sand, silt, gravel, and boulder material.	xxxxxx				
10	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	COLLUVIUM (Qc) Crystalline boulders in silty fine to medium sand matrix, light brown (5yr 5/6), quartzitic with hornblende. Increasing medium to coarse sand, some wood fragments.	oooooo				
15	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Rig chatter at 15.5, to 16.5 feet.		Not Applicable			
20	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Becomes medium sand (contains hornblende) with wood fragments. Moderate yellow brown (10yr 5/4).					
25	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Some drilling fluid loss at 24.0 feet.					
	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Increasing sand and gravel content moderate brown, (5yr 3/4).					

DRILLING CONTRACTOR H-F Drilling, Inc.

Fullerton, Ca.

LOGGED BY Amr M. Amr

DATE 10-12-90 CHECKED BY ACW



Waste Management, Inc.

ROCK BOREHOLE LOGBORING NO.
GMW--1

SITE NAME AND LOCATION

Gregory Canyon, near Pala, California

SHEET

2 of 3

DEPTH IN FEET	PERCENT RECOVERY	CORES				SOIL DESCRIPTION OR ROCK LITHOLOGY	SYMBOL	OBSERVED ROCK STRUCTURE(S)	SAMPLER AND BIT	CASING TYPE	BLOWS/FOOT ON CASING
		RUN NO.	NO. OF CORE-PIECES LARGER THAN 2X CORED DIAMETER	RECOVERY	RQD						
30		1	0	100	0	Crystalline pebbles in Silty Sand matrix light brown (5yr 5/6), slightly moist, fine to medium Sand, quartzitic with hornblende.		Not Applicable			
35		2	0	0	0	BONSALL TONALITE (Xb), weathered Wet, moderate yellow brown, (5yr 4/4) to dark yellow brown (10yr 4/2) w/gravel fragments; Contains hornblende, plagioclase, biotite;					
40		3	0	20	0	Becomes grayish black (2n2), friable "salt-and-pepper" texture; medium to coarse grained at 40 feet.					
45						Depth of hole miscalculated at 45 feet, actual depth 48 feet.					
50		4	2	100	50	Highly fractured.		N5W;40'E fracture			
55		5	8	100	90	LEUCOGRANODIORITE (Klm) Wet, moderate yellow brown (5yr 4/4), porphyritic texture, highly fractured; medium-grained dike Highly weathered.		N5W;20'S weathered surface N5W;60E, 1/10" aperture infilled w/calcite			
60		6	5	100	50	Quartz & Calcite infilling, at 65 feet. Weathered porphyritic dike; with 1.0' chalk-like zone, pinkish gray (5yr 8/1) at 66 feet.		N50W;65W Iron-stained fracture N80E;60'N fracture N5W;82'E fracture N5W;85'W fracture			
65											

DRILLING CONTRACTOR H-F Drilling, Inc.

Fullerton, Ca.

LOGGED BY Amr M. Amr

DATE 10-12-90 CHECKED BY ACW



Waste Management, Inc.

ROCK BOREHOLE LOG

BORING NO.

GMW-1

SITE NAME AND LOCATION

Gregory Canyon, near Pala, California

SHEET

3 of 3

DEPTH IN FEET	PERCENT RECOVERY	CORES				SOIL DESCRIPTION OR ROCK LITHOLOGY	SYMBOL	OBSERVED ROCK STRUCTURE(S)	SAMPLER AND BIT	CASING TYPE	BLOWS/FOOT ON CASING
		RUN NO.	NO. OF CORE-PIECES LARGER THAN 2X CORED DIAMETER	RECOVERY	ROD						
70		7	6	100	70	Becomes moderately fractured.					
		8	5	100	80	BONSALL TONALITE (Kb), weathered Wet, medium dark gray (3n3), highly fractured, contains hornblende, quartz, biotite; some ironstaining along fractures; 1/8" quartz & Hornblende crystals.		N6W;42°E fracture			
75		9	3	100	65	Becomes moderately fractured at 76 feet.					
80		10	3	100	50	Fracture containing quartz and calcite infilling. Friable, gravel & sandy clay material zone at 80 feet.		N5W;60°E fracture			
85		11	2	100	20	LEUCORANODIORITE (Klm) Wet, very light gray (8n8), gneissic texture Moderately fractured, gray with crystals of quartz, plagioclase and some biotite.		N5W;78°E fracture			
						BONSALL TONALITE (Kb), unweathered Wet, medium dark gray (3n3)		N80W;72°N fracture			
90								N80W;80°E fracture			
						Bottom of hole at 90.5 feet.					
95											
100											

DRILLING CONTRACTOR H-F Drilling, Inc.

Fullerton, Ca.

LOGGED BY Amr M. Amr

DATE 10-12-90 CHECKED BY ACW

Well No. GMW-1Boring No. X-Ref: ---**MONITOR WELL CONSTRUCTION SUMMARY**

Survey Coords: _____ Elevation Ground Level 329.840
 Top of Casing 331.360 feet

Drilling Summary:

Total Depth 90.5 feet
 Borehole Diameter 10 inches
 Casing Stic-up Height: 1.50 feet
 Driller H-F Drilling
Fullerton, Ca
 Rig Mud Rotary/Air Rotary
 Bit(s) Tungsten/Diamond
 Drilling Fluid: Mud/Air
 Protective Casing 5" Steel Conductor

Well Design & Specifications

Basis: Geologic Log x Geophysical Log
 Casing String (s): C=Casing S=Screen

Depth	String(s)	Elevation
+1.50 - 48.0	C1	---
48.0 - 54.0	S1	---
54.0 - 90.5	S2	---
---	---	---
---	---	---

Casing: C1 5" Steel Conductor

C2 _____

Screen: S1 5.0" Diam. Open HoleS2 4.25" Diam. Open HoleFilter Pack: None-Open holeGrout Seal: 0-48.0 feet Enviroplug (Bentonite)

Bentonite Seal: _____

Construction Time Log:

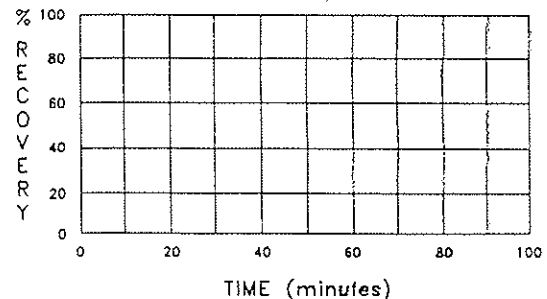
Task	Start		Finish	
	Date	Time	Date	Time
Drilling	7/7/90		7/13/90	
Geophys Logging:				
Casing:				
Filter Placement:				
Cementing:			7/9/90	
Development:			9/5/90	

Well Development:

Depth to water 34.25 (8/17/90) erroneous?
 Depth to water 22.48 (9/5/90)

Development Data:

Q=		S ₀ =	
Time	pH	Spec. Cond.	Temp (°F)
11:15	7.63	918 UMhos/cm	73.5
11:30	7.51	190 UMhos/cm	71.9
11:45	7.09	910 UMhos/cm	70.8
12:00	7.19	920 UMhos/cm	71.2



Comments: Depth to water after drilling:
21.25" below grade (8/13/90)

T.D. 90.5 ft.

INSPECTOR: Amr M. AmrCHECKED BY: ACWPROJECT: CA 012004LOCATION: Gregory Canyon, near Palo, California.



Waste Management, Inc.

ROCK BOREHOLE LOG

WELL GMW-2

See Plate 3
for Location**SITE NAME AND LOCATION**

Gregory Canyon, near Pala, California

BORING NO.

GMW-2

DRILLING METHOD: Mud Rotary & Air Rotary**SHEET**

HOLE DIAMETER: 10-inch (0-50 feet)

1 OF 4

4.25-inch (50-103 feet)

DRILLING

4-inch (103-106 feet)

START**FINISH**

WATER LEVEL 19.50 17.04

TIME**TIME****TIME****DATE**

8-17-90

9-5-90

DATE**DATE**

CASING DEPTH 50.0

8-13-90

8-17-90

DATUM: M.S.L.

ELEVATION: 324.64

DRILLING: Mobile B-61XD Rotary w/Christensen Coring

SURFACE CONDITIONS: Soil & Surface

ANGLE: Vertical

Note: Reference measurements points for lithology from ground

SAMPLE HAMMER TORQUE: Not Applicable

Surface; Water levels from Top of Casing

DEPTH IN FEET	PERCENT RECOVERY	CORES				SOIL DESCRIPTION OR ROCK LITHOLOGY	SYMBOL	OBSERVED ROCK STRUCTURE(S)	SAMPLER AND BIT	CASING TYPE	BLOWS/FOOT ON CASING
		RUN NO.	NO. OF CORE-PIECES LARGER THAN 2X CORED DIAMETER	RECOVERY	ROD						
5	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	ALLOUVIUM (Qal ₂) Silty sand & silt, dark yellow brown (10yr 5/4).					
10	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	More fine to coarse sand, moderate yellow brown (10yr 5/4) contains quartz, hornblende, plagioclase, at 10 feet.					
15	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Medium to coarse sand at 15 feet, more coarse sand sized grains of hornblende.		Not Applicable		Cuttings From Mud Circulation	Refer to Well Construction Summary
20	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Fine to medium sand at 20 feet, light brown (5yr 5/6), less hornblende grains. Rig chatter at 22 feet.					Not Applicable
25	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable						

DRILLING CONTRACTOR H.F. Drilling, Inc.

Fullerton, Ca.

LOGGED BY Amr M. Amr

DATE 10-12-90 CHECKED BY ACW



Waste Management, Inc.

ROCK BOREHOLE LOG

BORING NO.
GMW-2

SITE NAME AND LOCATION

Gregory Canyon, near Pala, California

SHEET

2 of 4

DEPTH IN FEET	PERCENT RECOVERY	CORES				SOIL DESCRIPTION OR ROCK LITHOLOGY	SYMBOL	OBSERVED ROCK STRUCTURE(S)	SAMPLER AND BIT	CASING TYPE	BLOWS/FOOT ON CASING
		RUN NO.	NO. OF CORE- PIECES LARGER THAN 2X CORED DIAMETER	RECOVERY	RQD						
30	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable						
35		1	0	50	0	Clayey sand with gravel sized fragments of quartz slightly micaceous, light brown (5yr 5/6).					
40		2	0	50	0	Clay at 37 feet, moderate brown (5yr 4/4). Clayey sand with fine to coarse quartzitic gravels.					
45		3	0	20	0	BONSALL TONALITE (Kb) weathered Moist medium gray (5n5), fine to coarse gravel-sized fragments up to 2" in diameter, highly fractured. Phaneritic texture.					
50		4	2	33	20	Missing 3 feet section from 50-53 feet.					
55		5	2	00	50	Becomes cork yellow brown (10yr 4/2), friable at 55 feet. Wet, medium dark gray (4n4); quartz-filled fracture at 57 feet.		NSW;35'E fracture			
60		6	0	20	0	Grayish black (2n2), friable gravel-sized fragments up to 1", 3"-wide fracture infilled w/white quartz.					
65											

DRILLING CONTRACTOR H-F Drilling, Inc.

Fullerton, Ca.

LOGGED BY Amr M. Amr

DATE 10-12-90 CHECKED BY ACW



Waste Management, Inc.

ROCK BOREHOLE LOGBORING NO.
GMW-2

SITE NAME AND LOCATION

Gregory Canyon, near Pala, California

SHEET

3 of 4

DEPTH IN FEET	PERCENT RECOVERY	CORES				SOIL DESCRIPTION OR ROCK LITHOLOGY	SYMBOL	OBSERVED ROCK STRUCTURE(S)	SAMPLER AND BIT	CASING TYPE	BLOWS/FOOT ON CASING
		RUN NO.	NO. OF CORE PIECES LARGER THAN 2X CORED DIAMETER	RECOVERY	ROD						
-		7	5	100	40	Moist, grayish black (2n2), "salt-and-pepper" texture, medium grained, highly fractured.					
- 70						Becomes very moist, dark gray (3n3), with quartz infilled fractures, iron-stained 68 to 71 feet.		N30W;45'NE fracture N30W;45'NE fracture N5W;52'E fracture			
-		8	4	100	70	Becomes grayish black (2n2), with quartz-infilled fracture, moderate orange pink (5yr 8/4), highly fractured.					
- 75								N40E;40'E fracture			
-		9	4	100	50	0.2" wide iron-stained, quartz-filled fracture at 77 feet. 2"-wide gravelly quartz infilled fracture.		N80W;62'S iron-stained fracture			
- 80								N5W;56'S fracture N5W;30'E fracture			
-		10	2	70	20	Wet, moderate yellow brown (10yr 5/4), quartz veinlets & silty sand fracture infilling. Becomes grayish black (2n2) without quartz veinlets, at 82 feet.					
- 85						Gravel-sized fragments, highly micaceous with biotite flakes.		N80E;62'S pyrite-bearing fracture			
-		11	3	90	60	Grades into more competent bedrock at 87.0'. Moderate yellow brown (10yr 5/4) to dark gray (4n4). Medium light gray (6n6) "salt-and-pepper" texture with conchoidal fracturing, moderately fractured.					
- 90								N80W;80'E fracture			
-		12	4	100	90	BONSALL TONALITE (Kb) unweathered Medium light gray (6n6), aphanitic texture, highly fractured iron-stained with calcite infilling.		N5W;74'W fracture			
- 95								N30E;41'W fracture N5W;85'E fracture			
-		13	3	100	95	0.5"-wide quartz-filled fracture.					
- 100						Pyrite-bearing and iron-stained fracture.		N82'E;42N fracture N5W;42'W fracture			
-		14	4	100	95	2"-wide filled fracture.					

DRILLING CONTRACTOR H-F Drilling, Inc.

Fullerton, Ca.

LOGGED BY Amr M. Amr

DATE 10-12-90 CHECKED BY ACW

ROCK BOREHOLE LOG

BORING NO.
GMW-2

SITE NAME AND LOCATION	DATE	TIME	OBSERVATIONS
1. [illegible]	[illegible]	[illegible]	[illegible]
2. [illegible]	[illegible]	[illegible]	[illegible]
3. [illegible]	[illegible]	[illegible]	[illegible]
4. [illegible]	[illegible]	[illegible]	[illegible]
5. [illegible]	[illegible]	[illegible]	[illegible]
6. [illegible]	[illegible]	[illegible]	[illegible]
7. [illegible]	[illegible]	[illegible]	[illegible]
8. [illegible]	[illegible]	[illegible]	[illegible]
9. [illegible]	[illegible]	[illegible]	[illegible]
10. [illegible]	[illegible]	[illegible]	[illegible]
11. [illegible]	[illegible]	[illegible]	[illegible]
12. [illegible]	[illegible]	[illegible]	[illegible]
13. [illegible]	[illegible]	[illegible]	[illegible]
14. [illegible]	[illegible]	[illegible]	[illegible]
15. [illegible]	[illegible]	[illegible]	[illegible]
16. [illegible]	[illegible]	[illegible]	[illegible]
17. [illegible]	[illegible]	[illegible]	[illegible]
18. [illegible]	[illegible]	[illegible]	[illegible]
19. [illegible]	[illegible]	[illegible]	[illegible]
20. [illegible]	[illegible]	[illegible]	[illegible]
21. [illegible]	[illegible]	[illegible]	[illegible]
22. [illegible]	[illegible]	[illegible]	[illegible]
23. [illegible]	[illegible]	[illegible]	[illegible]
24. [illegible]	[illegible]	[illegible]	[illegible]
25. [illegible]	[illegible]	[illegible]	[illegible]
26. [illegible]	[illegible]	[illegible]	[illegible]
27. [illegible]	[illegible]	[illegible]	[illegible]
28. [illegible]	[illegible]	[illegible]	[illegible]
29. [illegible]	[illegible]	[illegible]	[illegible]
30. [illegible]	[illegible]	[illegible]	[illegible]
31. [illegible]	[illegible]	[illegible]	[illegible]
32. [illegible]	[illegible]		

Gregory Canyon, near Pala, California

SHEET

4 OF 4

[illegible]

DRILLING CONTRACTOR H-F Drilling, Inc.

Fullerton, Ca.

LOGGED BY . Amr M. Amr

DATE 10-12-90 CHECKED BY ACW

Well No. GMW-2Boring No. X-Ref: -**MONITOR WELL CONSTRUCTION SUMMARY**

Survey Coords: _____ Elevation Ground Level 322.56
 _____ Top of Casing 324.640 feet

Drilling Summary:

Total Depth 106.0 feet
 Borehole Diameter 10 inches
 Casing Stic-up Height: 2.10 feet
 Driller J-F Drilling
Fullerton, Co
 Rig Mud Rotary/Air Rotary
 Bit(s) Chris. Bit/Diamond Bit
 Drilling Fluid: Mud/Air
 Protective Casing 5" Steel Conductor

Well Design & Specifications

Basis: Geologic Log x Geophysical Log
 Casing String (s): C=Casing S=Screen

Depth	String(s)	Elevation
+ 2.1 - 50.0	C1	-
50.0 - 103.0	S1	-
103.0 - 106.0	S2	-
-	-	-
-	-	-

Casing: C1 5" Steel Conductor

C2 _____

Screen: S1 4.25" Diam. Open HoleS2 4" Diam. Open HoleFilter Pack: NoneGrout Seal: 0-50.0 feet Enviroplug (Bentonite)

Bentonite Seal: _____

Construction Time Log:

Task	Start		Finish	
	Date	Time	Date	Time
Drilling	8/13/90		8/14/90	
	8/17/90		8/17/90	
Geophys Logging:				
Casing:				
Filter Placement:				
Cementing:			8/13/90	
Development:			9/5/90	

Well Development:

DTW 15.50' below grade

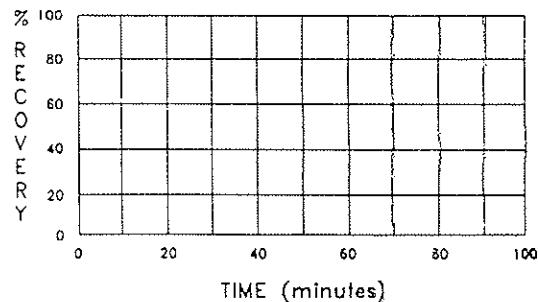
8/17/90 prior to drilling

additional 15.0'

Depth to water 17.04 (9/05/90)

Development Data:

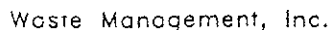
Q=		S ₀ =	
Time	pH	Spec. Cond.	Temp (°F)
10:00	7.65	930 UMhos/cm	72.2
10:15	7.38	909 UMhos/cm	70.8
10:25	7.37	902 UMhos/cm	70.4
10:30	7.38	903 UMhos/cm	71.1
10:40	7.35	919 UMhos/cm	71.9



Comments: Depth to water after drilling:
19.50' (8/14/90)

T.D. 106.0 ft.

INSPECTOR: Amr M. AmrCHECKED BY: ACWPROJECT: CA 012004LOCATION: Gregory Canyon, near Pala, California



WELL GMW-3

See Plate 3
for Location

DATUM: M.S.L.

ELEVATION: 320.36

DRILLING: Feiling F-10 WT

ANGLE: Vertical

SAMPLE HAMMER TORQUE: Not Applicable

SITE NAME AND LOCATION

Gregory Canyon, near Pala, California

BORING NO.

GMW-3

DRILLING METHOD: Hollow Stem Auger

HOLE DIAMETER: 10-inch (0-50 feet)

SHEET

1 OF 2

DRILLING

START

FINISH

WATER LEVEL

12.33

12.38

TIME

DATE _____

7-23-90	9-5-90
---------	--------

DATE _____

DATE

CASING DEPTH	50.0
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50.0

7-23-90

7-23-90

SURFACE CONDITIONS: Soil & Boulders

Note: Reference measurement points for lithology from

ground surface; water—levels from top of casing in feet.

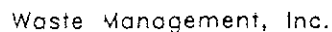
DEPTH IN FEET	SAMPLE INTERNAL	CORES				SOIL DESCRIPTION OR ROCK LITHOLOGY	SYMBOL	OBSERVED ROCK STRUCTURE(S)	SAMPLER AND BIT	CASING TYPE	BLOWS/FOOT ON CASING
		RUN NO.	NO. OF CORE- PIECES LARGER THAN 2X CORED DIAMETER	RECOVERY	ROD						
5	1	Not Applicable	Not Applicable	Not Applicable	Not Applicable	ALLUVIUM (Qal ₁) Poorly graded fine to medium, SAND (SP) slightly moist; light brown (5 yr 6/4).		Not Applicable	Split Spoon Sampler	Refer to Well Construction Summary	Not Applicable
	2					SILTY SAND (SM) pale yellowish brown (10yr 6/2), with interbeds of sand.					
	3					GRAVELLY SAND (SW) Fine to coarse sand, little fine gravel; "salt-and-pepper" hornblende & quartz; medium light gray (6n6), wet.					
	4					Gravel (up to 1"-diameter) at 20'. Becomes more cobbly.					
	5					SAND (SP-SM) with silt Becomes moderate reddish brown (10yr 4/6) to dark gray (3n3) at 24.5'.					

DRILLING CONTRACTOR H-F Drilling, Inc.

Fullerton, Co.

LOGGED BY Amr M. Amr

DATE	10-12-90	CHECKED BY	ACW
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BORING NO.
GMW-3

SITE NAME AND LOCATION

Gregory Canyon, near Pala, California

SHEET

2 of 2

DRILLING CONTRACTOR H-F Drilling, Inc.

LOGGED BY Amr. M. Amr

DATE 10-12-90 CHECKED BY ACW

Well No. GMW-3Boring No. X-Ref: -**MONITOR WELL CONSTRUCTION SUMMARY**

Survey Coords: _____

Elevation Ground Level 318.46Top of Casing 320.360 feet**Drilling Summary:**

Total Depth 49.5 feet
 Borehole Diameter 10 Inches
 Casing Stic-up Height: 2.50 feet
 Driller H-F Drilling
Fullerton, Ca
 Rig Hollow Stem Auger
 Bit(s) _____
 Drilling Fluid: None
 Protective Casing Steel looking well cover

Well Design & Specifications

Basis: Geologic Log x Geophysical Log
 Casing String (s): C=Casing S=Screen

Depth	String(s)	Elevation
+2.25 - 9.5	C1	-
9.50 - 49.5	S1	-
-	-	-
-	-	-
-	-	-

Casing: C1 4" diam. PVC Blank

C2 _____

Screen: S1 4" diam. 0.02 slotted PVC

C2 _____

Filter Pack: 2/12 SandGrout Seal: 2.5-6.5 feet Enviroplug (Bentonite)

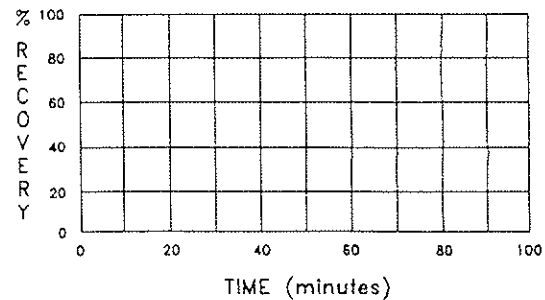
Bentonite Seal: _____

Construction Time Log:

Task	Start		Finish	
	Date	Time	Date	Time
Drilling	7/23/90		7/23/90	
Geophys Logging:				
Casing:				
Filter Placement:				
Cementing:			7/23/90	
Development:			9/5/90	

Well Development:Depth to water 12.60' (8/17/90)Depth to water 12.38' (9/05/90)**Development data:**

Q=		S ₀ =	
Time	pH	Spec. Cond.	Temp (°F)
8:30	7.83	1020 UMhos/cm	73.5
8:50	7.69	960 UMhos/cm	69.0
9:10	7.70	970 UMhos/cm	68.0

Comments: Depth to water after drilling: 12.83' (7/23/90)INSPECTOR: Amr M. AmrCHECKED BY: ACWPROJECT: CA 012004LOCATION: Gregory Canyon, near Palo, California.



Waste Management, Inc.

ROCK BOREHOLE LOG

WELL GMW-4

See Plate 3
for Location

SITE NAME AND LOCATION

Gregory Canyon, near Pala, California

BORING NO.

GMW-4

DRILLING METHOD: Air Rotary

SHEET

1 of 4

HOLE DIAMETER: 10-inch (0-55 feet)

4.25-inch (55-98.5 feet)

DRILLING

4-inch (98.5-116 feet)

START

FINISH

WATER LEVEL

76.0

85.71

TIME

TIME

TIME

DATE

8-17-90

9-5-90

DATE

DATE

CASING DEPTH

55.0

8-15-90

8-17-90

DATUM: M.S.L.

ELEVATION: 637.530

DRILLING: Mobile B-61XD Rotary w/Christensen Coring

SURFACE CONDITIONS: Soil & Boulders

ANGLE: Vertical

Note: Reference measurement points for lithology from

SAMPLE HAMMER TORQUE: Not Applicable

ground surface; water level from top of casing in feet.

DEPTH IN FEET	PERCENT RECOVERY	CORES				SOIL DESCRIPTION OR ROCK LITHOLOGY	SYMBOL	OBSERVED ROCK STRUCTURE(S)	SAMPLER AND BIT	CASING TYPE	BLOWS/FOOT ON CASING
		RUN NO.	NO. OF CORE-PIECES LARGER THAN 2X CORED DIAMETER	RECOVERY	ROD						
5	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	COLLUVIUM (Qc) Crystalline boulders in silty fine to medium sand matrix, moderate brown (5yr 4/4), quartzitic with hornblende Very fine to fine sand, grayish yellow green (5yr 7/2). Becomes light olive gray (5yr 5/2) at 10 feet. Little medium sand from 14 feet. Fine to coarse sand, light olive gray (5yr 5/2) at 20 feet. Fine to medium sand from 25 feet. (5yr 3/4).					
10											
15											
20											
25											

DRILLING CONTRACTOR H-F Drilling, Inc.

Fullerton, Ca.

LOGGED BY Amr M. Amr

DATE 10-12-90 CHECKED BY ACW



Waste Management, Inc.

ROCK BOREHOLE LOGBORING NO.
GMW-4

SITE NAME AND LOCATION

Gregory Canyon, near Pala, California

SHEET

2 of 4

DEPTH IN FEET	PERCENT RECOVERY	CORES				SOIL DESCRIPTION OR ROCK LITHOLOGY	SYMBOL	OBSERVED ROCK STRUCTURE(S)	SAMPLER AND BIT	CASING TYPE	BLOWS/FOOT ON CASING
		RUN NO.	NO. OF CORE-PIECES LARGER THAN 2X CORED DIAMETER	RECOVERY	RQD						
30	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable						
35	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Fine sand, moderate olive brown (5yr 4/4), encountered at 35 feet.					
40	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Fine to medium sand from 40 feet.					
45	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Fine sand, light olive gray (5yr 5/2). Difficult drilling from 47.0'.					
50	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	BONSALL TONALITE (Kb) weathered Moist, light brown (5yr 5/6) bedrock, with "salt-and-pepper" texture, highly fractured. Hornblende and quartz crystals.					
55	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Iron-stained					
60	Not Applicable	1	2	100	10	Medium grained crystals of hornblende, biotite and quartz, from 57 feet. Becomes dark yellowish orange (10yr 6/6), friable, grus 0.5" thick, with calcite. Yellow and black mottling.					
65	Not Applicable	2	4	100	70	Iron-stained fracture at 65 feet.					

DRILLING CONTRACTOR H-F Drilling, Inc.

Fullerton, Ca.

LOGGED BY Amr M. Amr

DATE 10-12-90 CHECKED BY ACW



Waste Management, Inc.

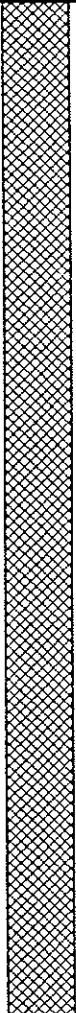



ROCK BOREHOLE LOGBORING NO.
GMW-4

SITE NAME AND LOCATION

Gregory Canyon, near Palo, California

SHEET

3 OF 4

DEPTH IN FEET	PERCENT RECOVERY	CORES				SOIL DESCRIPTION OR ROCK LITHOLOGY	SYMBOL	OBSERVED ROCK STRUCTURE(S)	SAMPLER AND BIT	CASING TYPE	BLOWS/FOOT ON CASING	
		RUN NO.	NO. OF CORE-PIECES LARGER THAN 2X CORED DIAMETER	RECOVERY	RQD							
70	Not Applicable	3	4	100	70	Medium gray (5n5), moderately fractured with phaneritic texture, appears iron-stained with silty sand fracture infilling.		N6W;42°E iron-stained fracture				
		4	3	100	40	Moist, dark yellow orange (10yr 6/6), very soft calcite zone at 72 feet.						
75		5	5	100	90	Very moist, pale olive (10yr 6/2), highly fractured with abundant quartz veins, calcite-infilled fractures with solution pitting at 75 feet.						
80		6	5	100	50	Weathered fracture is dark orange brown, near vertical, fracture is weathered at 80 feet. Greenish gray (5yr 6/1), iron-stained fracture with silty sand infilling at 82 feet.		N80E;83°N fracture				N5W;80°W fracture
85		7	4	100	60	N30W;70°W fracture						
90		8	6	100	75	Dark gray (3n3); wet with iron-stained fractures. BONSALL TONALITE (Kb) unweathered Fracture infilled, wet, medium gray (3n3), aphanitic texture highly fractured.		N5W;42°W iron-stained fracture				N5W;55°W fracture N17W;42°E fracture N5W;42°W fracture N80E;64°N fracture
95		9	4	100	45	Quartz dike 0.2"-wide with zoned hornblende and biotite inclusions at 92.0 feet. 1"-wide fracture zone with calcite infilling at 94 feet.						
100		10		100	30	0.1"-wide calcite-filled fracture.		N79E;74°N fracture				

DRILLING CONTRACTOR H-F Drilling, Inc.

Fullerton, Ca.

LOGGED BY Amr M. Amr

DATE 10-12-90 CHECKED BY ACW



Waste Management, Inc.

ROCK BOREHOLE LOGBORING NO.
GMW-4

SITE NAME AND LOCATION

Gregory Canyon, near Pala, California

SHEET

4 of 4

DEPTH IN FEET	PERCENT RECOVERY	CORES				SOIL DESCRIPTION OR ROCK LITHOLOGY	SYMBOL	OBSERVED ROCK STRUCTURE(S)	SAMPLER AND BIT	CASING TYPE	BLOWS/FOOT ON CASING
		RUN NO.	NO. OF CORE- PIECES LARGER THAN 2X CORED DIAMETER	RECOVERY	ROD						
105		11	7	100	90	Wet, medium gray (3n3), aphanitic texture, highly fractured, with calcite infilling fracture. Ironstained fracture 0.1"-wide Calcite infilled fracture. Conjugate fractures 2" apart. 1"-wide Calcite filled fracture.	[Hatched Pattern]	N50E;49'E fracture N80E;52'S fracture N80E;52'S fracture N5W;45'W fracture N58E;50'N fracture N8W;60'W fracture	↑ Christensen Wire Line Coring ↓	↑ Refer to Well Construction Summary ↓	↑ Not Applicable ↓
110		12	5	100	95	1/2"-wide iron-stained fractured infilled with gray fluorite & calcite. Iron-stained fracture		N80E;46'S fracture N80E;46'S fracture N8W;55'E fracture			
115		13	5	100	95	Dark yellow orange (10yr 6/6) iron-stained, calcite-filled fracture. Calcite-filled fractures.		N70E;45'S fracture N80W;85'N fracture			
120						Bottom of boring at 116.0 feet.					
125											
130											
135											

DRILLING CONTRACTOR H-F Drilling, Inc.

Fullerton, Co.

LOGGED BY Amr M. Amr

DATE 10-12-90 CHECKED BY ACW

Well No. GMW-4Boring No. X-Ref: -**MONITOR WELL CONSTRUCTION SUMMARY**Survey Coords: _____ Elevation Ground Level Approximately 635.280Top of Casing 637.530 feet**Drilling Summary:**Total Depth 116.0 feetBorehole Diameter 10 inchesCasing Stic-up Height: 2.25 feetDriller T-F DrillingFulerton, CaRig Air RotaryBit(s) Christiansen/Bt/DiamondDrilling Fluid: Air

Protective Casing _____

Construction Time Log:

Task	Start		Finish	
	Date	Time	Date	Time
Drilling	8/15/90		8/17/90	
Geophys Logging:				
Casing:				
Filter Placement:				
Cementing:			8/15/90	
Development:			9/5/90	

Well Design & Specifications

Basis: Geologic Log x Geophysical Log

Casing String (s): C=Casing S=Screen

Depth	String(s)	Elevation
+2.25 - 55.0	C1	-
55 - 98.5	S1	-
98.5 - 116.0	S2	-
-	-	-
-	-	-

Casing: C1 5" Steel Conductor

C2 _____

Screen: S1 4.25" Diam Open Hole

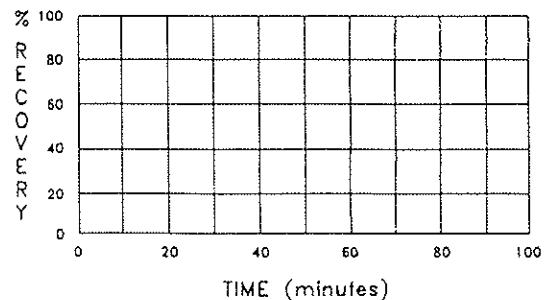
C2 _____

4.00" Diam. Open HoleFilter Pack: NoneGrout Seal: 0-55.0 feet Enviroplug (Bentonite)

Bentonite Seal: _____

Well Development:Depth to water 80.75 (8/17/90)Depth to water 85.71 (9/05/90)**Development Data:**

Q=		S ₀ =	
Time	pH	Spec. Cond.	Temp (°F)
12:55	7.61	1042 UMhos/cm	75.5
1:10	7.24	995 UMhos/cm	72.2
1:25	7.46	1027 UMhos/cm	71.6
1:45	7.51	1020 UMhos/cm	70.5

Comments: Depth to water after drilling: 80.75 feet (8-17-90)T.D. 116.0 ft.INSPECTOR: Amr M. AmrCHECKED BY: ACW

CA 012004

PROJECT:

LOCATION: Gregory Canyon, near Palo, California.



Waste Management, Inc.

ROCK BOREHOLE LOG

WELL GMP-1

See Plate 3
for Location

SITE NAME AND LOCATION

Gregory Canyon, near Pala, California

BORING NO.

GMP-1

DRILLING METHOD: Air Rotary & Mud Rotary

SHEET

1 OF 3

HOLE DIAMETER: 10-inch (0-41 feet)

5-inch (41-81 feet)

DRILLING

WATER LEVEL

76.0

63.88

TIME

DATE

7-3-90

8-6-90

CASING DEPTH

48.0

START

TIME

FINISH

TIME

DATE

7-31-90

DATE

8-2-90

DATUM: M.S.L.

ELEVATION: 460.29

DRILLING: Mobile B-61XD Rotary w/Christensen Coring


SURFACE CONDITIONS: Soil & Boulders

ANGLE: Vertical

Note: Reference measurement points for lithology from

SAMPLE HAMMER TORQUE: Not Applicable

ground surface; water levels from top of casing in feet.

DEPTH IN FEET	PERCENT RECOVERY	CORES				SOIL DESCRIPTION OR ROCK LITHOLOGY	SYMBOL	OBSERVED ROCK STRUCTURE(S)	SAMPLER AND BIT	CASING TYPE	BLOWS/FOOT ON CASING
		RUN NO.	NO. OF CORE- PIECES LARGER THAN 2X CORED DIAMETER	RECOVERY	RQD						
5	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	COLLUVIUM (Qc) Crystalline boulders in silty fine to medium sand matrix, light brown (SYR 5/6). Silty sand, yellowish gray (5yr 7/2).		Not Applicable	Cuttings	Refer to Well Construction Summary	Not Applicable
10	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Increasing fine to medium sand, dark gray (3n3), little yellow quartzitic fine to medium gray (5n5) at 12 feet.						
15	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Becomes grayish black (2n2), trace yellow quartzitic sand						
20	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Becomes coarse sand, medium dark gray (4n4), little quartz fragments, some leaf fragments.						
25	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Slow drilling at 26.0 feet. Contains hornblende, plagioclase fragments and biotite flakes.						

DRILLING CONTRACTOR H-F Drilling, Inc.

Fullerton, Co.

LOGGED BY Amr M. Amr

DATE 10-12-90 CHECKED BY ACW



Waste Management, Inc.

ROCK BOREHOLE LOG

BORING NO.
GMP-1

SITE NAME AND LOCATION

Gregory Canyon, near Pala, California

SHEET

2 OF 3

DEPTH IN FEET	PERCENT RECOVERY	CORES				SOIL DESCRIPTION OR ROCK LITHOLOGY	SYMBOL	OBSERVED ROCK STRUCTURE(S)	SAMPLER AND BIT	CASING TYPE	BLOWS/FOOT ON CASING
		RUN NO.	NO. OF CORE- PIECES LARGER THAN 2X CORED DIAMETER	RECOVERY	ROD						
30	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Matrix becomes medium gray (5n5).					
35	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Increasing coarse sand, some small wood fragments.					
40	Not Applicable	1	2	66	10	BONSALL TONALITE (Kb) weathered Slightly moist, dark yellow brown (10yr 4/2), highly fractured, 0.5-1.0' fracture spacing.					
45	Not Applicable	2	1	80	10	missing 46-47 feet. Fracture infilling. Silty sand and iron-staining.		N5W,60°E fracture N80E;66°N fracture			
50	Not Applicable	3	2	100	15	Rock sample collected for thin section analysis at 51 feet. Classified as a Quartz Gabbro, see sample GMP-1-51, in Appendix F.		N5W,62°E fracture			
55	Not Applicable	4	4	60	30	Medium grained plagioclase crystals w/hornblende & biotite, vein filled w/calcite. Moderate yellow brown (10yr 5/4), Poikilitic texture at 55 feet. Missing 56-58 feet.		N5W,71°E fracture			
60	Not Applicable	5	5	100	80	White chalky material in-filling fracture at 60 feet. Moist, medium Gray (5n5), ironstained. 2"-wide in-filled vein, slightly moist, light brown (5yr 6/4).		N5W,80°E fracture			
65	Not Applicable										

DRILLING CONTRACTOR H-F Drilling, Inc.

Fullerton, Ca.

LOGGED BY Amr Amr

DATE 10-12-90 CHECKED BY ACW



Waste Management, Inc.

ROCK BOREHOLE LOG

BORING NO.
GMP-1

SITE NAME AND LOCATION

Gregory Canyon, near Pala, California

SHEET

3 of 3

DEPTH IN FEET	PERCENT RECOVERY	CORES				SOIL DESCRIPTION OR ROCK LITHOLOGY	SYMBOL	OBSERVED ROCK STRUCTURE(S)	SAMPLER AND BIT	CASING TYPE	BLOWS/FOOT ON CASING
		RUN NO.	NO. OF CORE- PIECES LARGER THAN 2X CORE DIAMETER	RECOVERY	ROD						
70	Not Applicable	6	5	90	80	Medium gray (5n5), highly fractured. With hornblende, and "salt-and-pepper" texture, dark gray (3n3) at 70 feet. Iron-stained, calcite-infilled fracture, white (9n9).		N80W;45°N fracture			
		7	6	100	80			N84E;74°N Ironstained fracture.			
75						Medium grained plagioclase with biotite, 1/8"-wide vein in-filled with white calcite.		N6W;74°E fracture			
80		8	5	90	70	Rock sample collected for thin section analysis at 76 feet classified as quartz gabbro, see sample GMP-1-76 in Appendix, F. 1.0'-wide sandy silt in-filled fracture, yellowish gray (5yr 7/2), white (9n9). Vein in-filling.		N5W;62°E infilled fracture			
						Medium gray (5n5). Very friable.		N6W;72°E fracture			
						Bottom of boring at 81.0 feet.					
85											
90											
95											
100											

DRILLING CONTRACTOR H-F Drilling, Inc.

Fullerton, Ca.

LOGGED BY Amr M. Amr

DATE 10-12-90 CHECKED BY ACW

Well No. GMP-1

Boring No. X-Ref: _____

MONITOR WELL CONSTRUCTION SUMMARY

Survey Coords: _____ Elevation Ground Level Approximately 459.0

Top of Casing 460.290 feet

Drilling Summary:

Total Depth 81.0 feet

Borehole Diameter 10 Inches

Casing Stic-up Height: 1.28 feet

Driller F-F Drilling

Fullerton, Ca

Rig Mud Rotary/Air Rotary

Bit(s) Tungsten Bit.

Drilling Fluid: Mud/Air

Protective Casing 5" Steel Conductor

Well Design & Specifications

Basis: Geologic Log x Geophysical Log

Casing String (s): C=Casing S=Screen

Depth	String(s)	Elevation
+1.28 - 41.1	C1	-
41.16 - 81.0	S1	-
-	-	-
-	-	-
-	-	-
-	-	-

Casing: C1 5" Steel Conductor

C2

Screen: S1 5" Diam. Open Hole

S2

Filler Pack: None

Grout Seal: 0-41.1 feet Enviroplug (Bentonite)

Bentonite Seal:

Construction Time Log:

Task	Start		Finish	
	Date	Time	Date	Time
Drilling	7/31/90		8/2/90	
Geophys Logging:				
Casing:				
Filter Placement:				
Cementing:			7/31/90	
Development:				

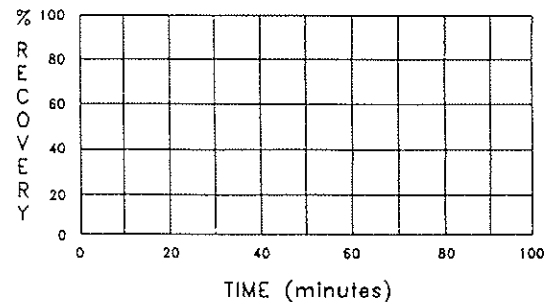
Well Development:

Depth to water 62.32 (8/17/90)

Depth to water 63.88 (9/5/90)

Development Data:

Q=		S ₀ =	
Time	pH	Spec. Cond.	Temp (°C)



Comments: Depth to water after drilling:
69.0' feet below grade. (8/2/90)

INSPECTOR: Amir M. Amir

CHECKED BY: ACW

PROJECT: CA 012004

LOCATION: Gregory Canyon, near Pala, California.



Waste Management, Inc.

ROCK BOREHOLE LOG

WELL GMP-2

See Plate 3
for Location

SITE NAME AND LOCATION

Gregory Canyon, near Pala, California

BORING NO.

GMP-2

DRILLING METHOD: Air Rotary

SHEET

1 OF 3

HOLE DIAMETER: 10-inch (0-45 feet)

5-inch (45-70 feet)

DRILLING

4-inch (70-87.5 feet)

START

FINISH

WATER LEVEL

83.36

83.74

TIME

TIME

TIME

DATE

7-30-90 9-5-90

DATE

DATE

DATUM: M.S.L.

ELEVATION: 437.64

CASING DEPTH

44.8

7-25-90

7-30-90

DRILLING: Mobile B-61XD Rotary w/christensen coring

SURFACE CONDITIONS: Soil & Boulders

ANGLE: Vertical

Note: Reference measurement points for lithology from

SAMPLE HAMMER TORQUE: Not Applicable

ground surface; water levels from top of casing in feet.

DEPTH IN FEET	PERCENT RECOVERY	CORES				SOIL DESCRIPTION OR ROCK LITHOLOGY	SYMBOL	OBSERVED ROCK STRUCTURE(S)	SAMPLER AND BIT	CASING TYPE	BLOWS/FOOT ON CASING
		RUN NO.	NO. OF CORE- PIECES LARGER THAN 2X CORED DIAMETER	RECOVERY	RQD						
5	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	COLLUVIUM (Qc) Crystalline boulders in silty fine to medium sand matrix, light brown (5yr 6/4), quartzitic with hornblende.		Not Applicable	Cuttings from mud Circulation	Refer to Well Constuction Summary	Not Applicable
10	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Rig chatter at 8 1/2 feet. Fine to medium sand, moderate yellow brown (10yr 5/4).						
15	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Increasing coarse sand.						
20	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Becomes brownish gray (5yr 4/1). Organic matter with wood fragments.						
25	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Fewer wood fragments, grayish black (2n2). Medium grained sand.						

DRILLING CONTRACTOR H-F Drilling, Inc.

Fullerton, Ca.

LOGGED BY Amr M. Amr

DATE 10-12-90 CHECKED BY ACW



Waste Management, Inc.

ROCK BOREHOLE LOGBORING NO.
GMP-2

SITE NAME AND LOCATION

Gregory Canyon, near Pala, California

SHEET

2 of 3

DEPTH IN FEET	PERCENT RECOVERY	CORES				SOIL DESCRIPTION OR ROCK LITHOLOGY	SYMBOL	OBSERVED ROCK STRUCTURE(S)	SAMPLER AND BIT	CASING TYPE	BLOWS/FOOT ON CASING
		RUN NO.	NO. OF CORE- PIECES LARGER THAN 2X CORED DIAMETER	RECOVERY	RQD						
30	↑	↑	↑	↑	↑	Becomes brownish gray (5yr 4/1), at 30 feet.					
35	↑	Not Applicable	Not Applicable	Not Applicable	Not Applicable						
40	↑	↑	↑	↑	↑	Increasing medium to coarse sand at 40 feet.					
45	↑	1	0	0	0						
50	↑	2	0	0	0	BONSALL TONALITE (Kb) weathered Light gray (5yr 5/2), phaneritic texture, highly fractured with iron-stained fractures.					
55	↑	3	0	100	0	Missing 52.5 to 56.0 feet.					
60	↑	4	0	0	0						
65	↑	5	0	0	0	Missing 56.0 to 60.5 feet.					
	↑	6	0	0	0	Rock sample collected for thin section analysis at 58 feet. Classified as a Alkali Feldspar Granite Porphyry, See sample GMP-2-58, in Appendix F.					
	↑	6	0	100	0	Switched to tungsten bit to improve recovery at 60.5. Moderate yellow brown (10yr 5/4), weathered w/1/4"-wide porphyritic dike. Platy weathered abundant biotite Becomes dark gray (3n3) at 63 feet.		N30°W trending dike			
	↑	7	0	100	0	LEUCOGRANODIORITE (Klm) light brown (5yr 6/4) dike material.					

DRILLING CONTRACTOR H-F Drilling, Inc.

Fullerton, Ca.

LOGGED BY Amr M. Amr

DATE 10-12-90 CHECKED BY ACW



Waste Management, Inc.

ROCK BOREHOLE LOGBORING NO.
GMP-2

SITE NAME AND LOCATION

Gregory Canyon, near Pala, California

SHEET

3 of 3

DEPTH IN FEET	PERCENT RECOVERY	CORES				SOIL DESCRIPTION OR ROCK LITHOLOGY	SYMBOL	OBSERVED ROCK STRUCTURE(S)	SAMPLER AND BIT	CASING TYPE	BLOWS/FOOT ON CASING
		RUN NO.	NO. OF CORE- PIECES LARGER THAN 2X CORED DIAMETER	RECOVERY	RQD						
70 75 80 85	Not Applicable	8	0	100	0	BONSALL TONALITE (Kb) Moderate yellow brown (10yr 5/4) phaneritic texture, highly fractured, iron-stained fractures.		N15W;62°W fracture	Christensen Wire Line Coring	Refer to Well Construction Summary	Not Applicable
		9	2	100	20	LEUCOGRANODIORITE (Klm) Light brown (5yr 6/4), porphyritic dike vein, infilled with silty sand. Drilling difficult at 70.5 feet.					
		10	3	90	25	Porphyritic texture, highly fractured					
		11	3	75	20	Medium light gray (6n6) aphanitic texture, vertical micro fractures. Very light gray (8n8), phaneritic texture					
		12	3	100	30	Less weathered, fine to medium phaneritic texture.					
90 95 100					Bottom of boring at 87.0 feet.						

DRILLING CONTRACTOR H-F Drilling, Inc.

Fullerton, Ca.

LOGGED BY Amr Amr

DATE 10-12-90 CHECKED BY ACW

Well No. GMP-2Boring No. X-Ref: -**MONITOR WELL CONSTRUCTION SUMMARY**

Survey Coords: _____

Elevation Ground Level

Approximately 436.52

Top of Casing

437.640 feet**Drilling Summary:**Total Depth 87.5 feetBorehole Diameter 10 inchesCasing Stic-up Height: 1.12 feetDriller H-F DrillingFullerton, CoRig Mud Rotary/Air RotaryBit(s) Diamond/TungstenDrilling Fluid: Mud/AirProtective Casing 5" Steel Conductor**Well Design & Specifications**

Basis: Geologic Log x Geophysical Log

Casing String (s): C=Casing S=Screen

Depth	String(s)	Elevation
+1.12 - 45.0	C1	-
45.0 - 70.0	S1	-
70.0 - 87.5	S2	-
-	-	-
-	-	-

Casing: C1 5" Steel Conductor

C2 _____

Screen: S1 5" Diam. Open HoleS2 4" Diam. Open Hole

S3 _____

Filter Pack: NoneGrout Seal: 0-45.0 feet Enviroplug (Bentonite)

Bentonite Seal: _____

Construction Time Log:

Task	Start		Finish	
	Date	Time	Date	Time
Drilling	7/25/90		7/30/90	
Geophys Logging:				
Casing:				
Filter Placement:				
Cementing:			7/26/90	
Development:				

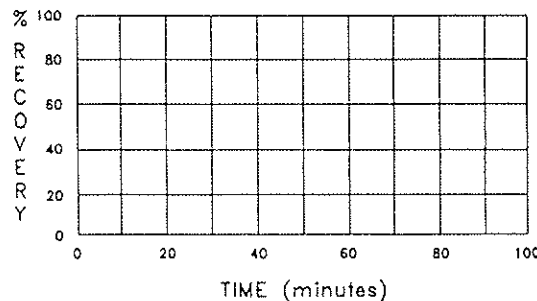
Well Development:

Depth to water 82.24' (8/17/90)

Depth to water 83.74' (9/05/90)

Development Data:

Q=		S ₀ =	
Time	pH	Spec. Cond.	Temp (°C)

Comments: Depth to water after drilling:83.36' Below Grade (7/30/90)

T.D. 87.5 ft.

INSPECTOR: Amr M. AmrCHECKED BY: ACWPROJECT: CA 012004LOCATION: Gregory Canyon, near Pala, California.



Waste Management, Inc.

ROCK BOREHOLE LOG

WELL GMP-3

See Plate 3
for Location

SITE NAME AND LOCATION

Gregory Canyon, near Pala, California

BORING NO.

GMP-3

DRILLING METHOD: Air Rotary

SHEET

HOLE DIAMETER: 10-inch (0-40 feet)

1 OF 3

4.25-inch (40-70 feet)

DRILLING

4-inch (70-81 feet)

START

FINISH

WATER LEVEL

76.0'

DRY

TIME

TIME

TIME

DATE

8-7-90

9-5-90

DATE

8-3-90

8-7-90

CASING DEPTH

40.0

DATUM: M.S.L.

ELEVATION: 469.26

DRILLING: Mobile B-61XD Rotary w/christensen coring

SURFACE CONDITIONS: Soil & Boulders

ANGLE: Vertical

Note: Reference measurement points for lithology from

SAMPLE HAMMER TORQUE: Not Applicable

ground surface; water levels from top of casing in feet.

DEPTH IN FEET	PERCENT RECOVERY	CORES				SOIL DESCRIPTION OR ROCK LITHOLOGY	SYMBOL	OBSERVED ROCK STRUCTURE(S)	SAMPLER AND BIT	CASING TYPE	BLOWS/FOOT ON CASING
		RUN NO.	NO. OF CORE- PIECES LARGER THAN 2X CORED DIAMETER	RECOVERY	ROD						
5	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	BONSALL TONALITE (Kb) weathered Silty sand, very light gray (7n7), Medium grained, phaneritic, texture.		Not Applicable			
10	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	More fine to coarse sand, light brownish gray (5yr 6/1) at 6 feet.					
15	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Little fine gravel; medium gray (5n5) at 9 feet.					
20	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Increasing fine angular gravel.					
25	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Becomes fine to medium sand; pale yellow brown (10yr 6/2) at 20 feet.					
	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Fine to medium sand					

DRILLING CONTRACTOR H-F Drilling, Inc.

Fullerton, Co.

LOGGED BY

Amr Amr

DATE 10-12-90

CHECKED BY

ACW



Waste Management, Inc.

ROCK BOREHOLE LOG

BORING NO.
GMP-3

SITE NAME AND LOCATION

Gregory Canyon, near Palo, California

SHEET

2 of 3

DEPTH IN FEET	PERCENT RECOVERY	CORES				SOIL DESCRIPTION OR ROCK LITHOLOGY	SYMBOL	OBSERVED ROCK STRUCTURE(S)	SAMPLER AND BIT	CASING TYPE	BLOWS/FOOT ON CASING
		RUN NO.	NO. OF CORE- PIECES LARGER THAN 2X CORED DIAMETER	RECOVERY	ROD						
30	↑	↑	↑	↑	↑	Becomes friable, moderately fractured brownish gray (5yr 4/1).					
35	↑	↑	↑	↑	↑						
40	↑	↑	↑	↑	↑	Becomes medium gray (5n5), moderately fractured from 40-55 feet. Highly fractured with Quartz vein infilling.		N40E;66'S fracture			
45	↑	↑	↑	↑	↑	Becomes highly micaceous, iron-stained at 45 feet. Poikilitic texture with hornblende and feldspar crystals at 47 feet. Becomes medium dark gray (4n4).		N50W;70'W fracture N56E;60'S fracture			
50	↑	↑	↑	↑	↑	Becomes very light gray (8n8), quartz vein with 1/4"-wide biotite flakes. 1/8" hornblende crystals, porphyritic texture.		N62E;60'S 1/8" calcite filled vein			
55	↑	↑	↑	↑	↑	Becomes very friable, medium gray (4n4). Light brown (5yr 5/6), iron-stained highly fractured from 56 to 68 feet. Becomes grayish black (2n2) fracture.		N54E;56'E fracture N60E;66'E fracture			
60	↑	↑	↑	↑	↑	Becomes medium dark gray (4n4), coat quartz-filled veinlets.					
65	↑	↑	↑	↑	↑	Very light gray (8n8), porphyritic dike.		N69'E;66'W fracture			

DRILLING CONTRACTOR H-F Drilling, Inc.

Fullerton, Ca.

LOGGED BY Amr Amr
DATE 10-12-90 CHECKED BY ACW



Waste Management, Inc.

ROCK BOREHOLE LOGBORING NO.
GMP-3

SITE NAME AND LOCATION

Gregory Canyon, near Pala, California

SHEET

3 of 3

DEPTH IN FEET	PERCENT RECOVERY	CORES				SOIL DESCRIPTION OR ROCK LITHOLOGY	SYMBOL	OBSERVED ROCK STRUCTURE(S)	SAMPLER AND BIT	CASING TYPE	BLOWS/FOOT ON CASING
		RUN NO.	NO. OF CORE- PIECES LARGER THAN 2X CORED DIAMETER	RECOVERY	ROD						
70	Not Applicable	6	1	100	10	Becomes light gray (8n8), medium grained, highly fractured.		N58W;40°W fracture N5W;72°E iron-stained fracture N80E;70°S iron-stained fracture N32°E;68°E iron-stained slightly micaceous fractured N32°E;62°W fracture N5W;61°W fracture	Christensen Wire Line Coring	Refer to Well Construction Summary	Not Applicable
		7	0	100	0	BONSALL TONALITE (Kb) unweathered Medium gray (5n5), aphanitic texture, highly fractured. Very hard; light gray (7n7). Very hard, at 70 feet.					
		8	1	100	80						
		9	2	100	40						
		10	1	25	80	Fractured, iron-stained.					
80						Bottom of boring at 81.0 feet.					
85											
90											
95											
100											

DRILLING CONTRACTOR H-F Drilling, Inc.

Fullerton, Co.

LOGGED BY Amr M. Amr

DATE 10-12-90 CHECKED BY ACW

Boring No. X-Ref:

MONITOR WELL CONSTRUCTION SUMMARY

Survey Coords: _____ Elevation Ground Level Approximately 467.89
 _____ Top of Casing 469.260 feet

Drilling Summary:

Total Depth 81.0 feet
Borehole Diameter 10 inches
Casing Stick-up Height: 1.55 feet
Driller H-F Drilling
Fullerton, Ca

Rig Air Rotary
Bit(s) Tungsten Bit/ Diamond

Drilling Fluid: Air

Protective Casing 5" Steel Conductor

Well Design & Specifications

Basis: Geologic Log x Geophysical Log
Casing String (s): C=Casing S=Screen

Depth		String(s)	Elevation
+1.55	— 40.1	C1	—
40.16	— 70.0	S1	—
70.0	— 81.0	S2	—
—	—	—	—
—	—	—	—

Casing: C1 5" Steel Conductor

C2

Screen: S1 4.25" Diam. Open Hole

52

Filter Pack: None

Grout Seal: 40.16-0 feet Enviroplug

Bentonite Seal:

Construction Time Log:

	Start		Finish	
Task	Date	Time	Date	Time
Drilling	8/3/90		8/7/90	
Geophys Logging:				
Casing:				
Filter Placement:				
Cementing:			8/3/90	
Development:				

Well Development:

Depth to water: Dry (8/17/90)

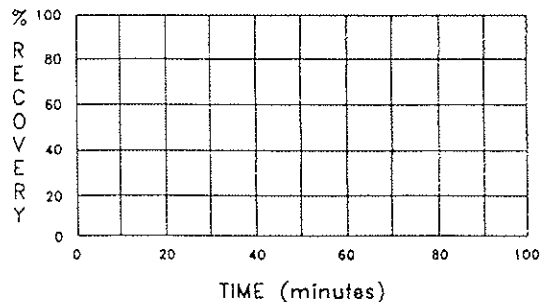
Depth to water: Dry (9/5/90)

Development Data:

 $Q =$

So =

Time	pH	Spec. Cond.	Temp (°C)



Comments:	Depth to water after drilling: 76.0' below grade. (8/7/90)
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T.D. 81.0 ft.

Amr M. Amr

INSPECTOR:

CA 012004

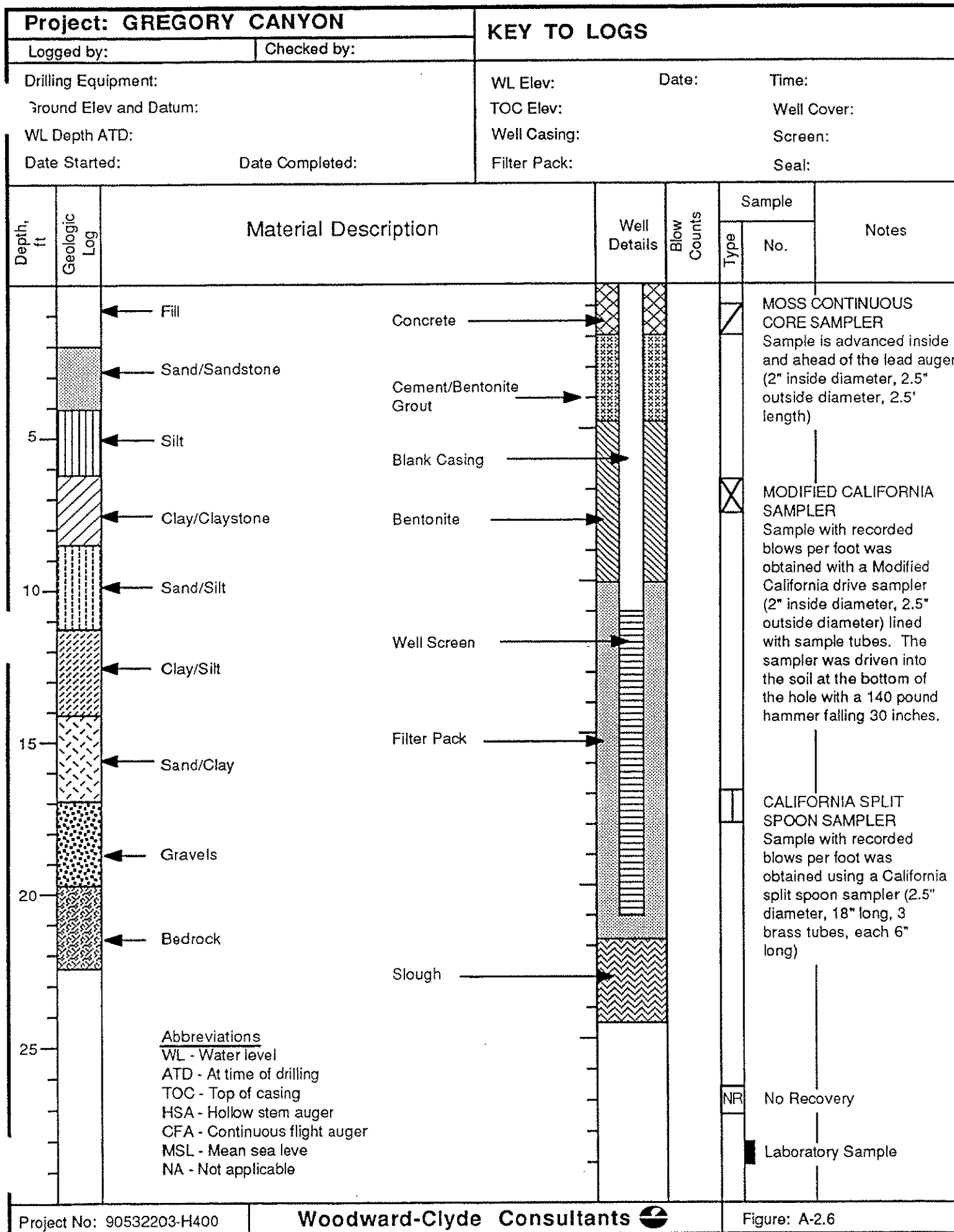
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ACW

CHECKED BY:-

Gregory Canyon, near Palo, California.

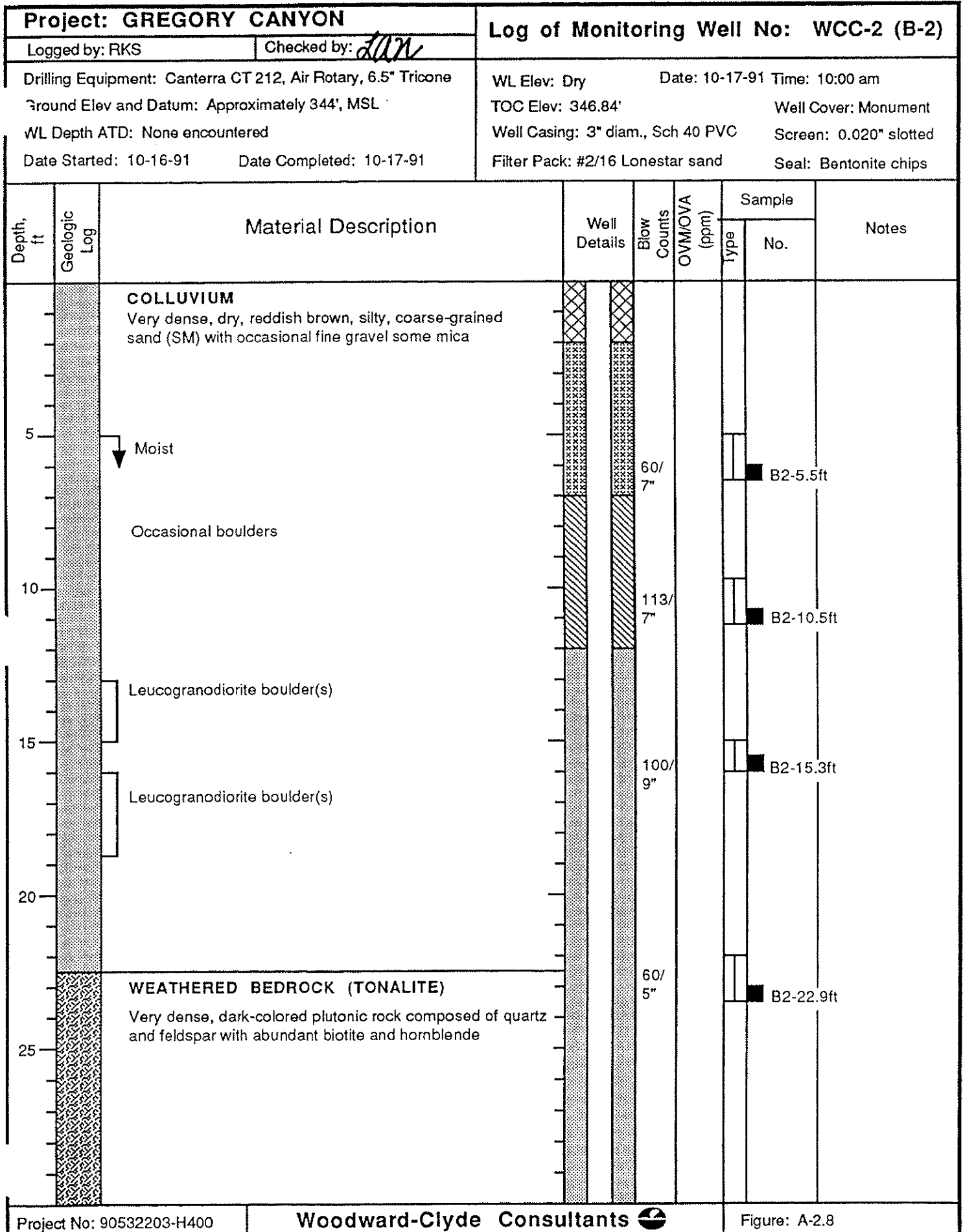
LOCATION:



Project: GREGORY CANYON				Log of Test Boring No: B-1			
Logged by: RKS		Checked by: <i>LAN</i>					
Drilling Equipment: Canterra CT 212, Air Rotary, 6.5" Tricone							
Ground Elev and Datum: Approximately 369', MSL							
WL Depth ATD: None encountered							
Date Started: 10-15-91 Date Completed: 10-15-91							

Depth, ft	Geologic Log	Material Description	Blow Counts	OVM/OVA (ppm)	Sample		Notes
					type	No.	
	Geologic Log	COLLUVIUM Dry, reddish brown, clayey sand (SC)					No samples retained. Logged using drill cuttings
		Cobbles/gravel					
5							
		Cobbles/gravel					
10		----- Dry, reddish brown, silty, fine-grained sand (SM)					
15							
20		Leucogranodiorite boulder					
25		Bottom of boring at 20 feet Boring backfilled with 3/8-inch bentonite chips hydrated during placement					

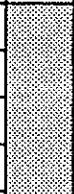

Project No: 90532203-H400	Woodward-Clyde Consultants	Figure: A-2.7
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Project: GREGORY CANYON

Log of Monitoring Well No. WCC-2 (Cont'd)

Depth, ft	Geologic Log	Material Description	Well Details	Blow Counts	OVM/OVA (ppm)	Sample		Notes
						Type	No.	
		(Continued) very dense, dark-colored plutonic rock composed of quartz and feldspar with abundant biotite and hornblende		60/ 4"				
35				40/ 3"				
40		↓ Becomes more dense		130/ 6"			B2-40ft	Hole abandoned at 35'. Sampler dropped into boring. Drill new hole, 10' north, 35' total depth - no samples retained
45				110/ 3"			B2-45ft	
50		Bottom of boring at 50 feet						
55								
60								

Project: GREGORY CANYON		Log of Test Boring No: B-3					
Logged by: RKS		Checked by: <i>LAM</i>					
Drilling Equipment: Canterra CT 212, Air Rotary, 6.5" Tricone Ground Elev and Datum: Approximately 377', MSL WL Depth ATD: Approximately 33' Date Started: 10-16-91 Date Completed: 10-16-91							
Depth, ft	Geologic Log	Material Description	Blow Counts	OVM/OVA (ppm)	Sample		Notes
					Type	No.	
5		COLLUVIUM Dry, reddish brown, silty, fine-grained sand (SM) with cobbles/ boulders					
10			60/ 3"				Refusal, no sample retained
15		WEATHERED BEDROCK (TONALITE) Plutonic rock composed of quartz, feldspar, hornblende and biotite; foliated					
20							
25							

Project: GREGORY CANYON				Log of Boring No.: B-3			
Depth, ft	Geologic Log	Material Description	Blow Counts	SPT/NOVA (ppm)	Sample		Notes
					Type	No.	
		(Continued) plutonic rock composed of quartz, feldspar hornblende and biotite; foliated					Drilling harder at 30'
		Becomes wet					Encountered water at 33', boring sloughed 33' to 35'
35		Bottom of Boring at 35 feet					
		Boring backfilled with 3/8-inch bentonite chips hydrated during placement					
40							
45							
50							
55							
60							

Project: GREGORY CANYON		Log of Test Boring No: B-4					
Logged by: RKS	Checked by: <i>DM</i>						
Drilling Equipment: Canterra CT 212, Air Rotary, 6.5" Tricone Ground Elev and Datum: Approximately 361', MSL WL Depth ATD: None encountered Date Started: 10-16-91 Date Completed: 10-16-91							
Depth, ft	Geologic Log	Material Description	Blow Counts	OVM/OVA (ppm)	Sample Type	Sample No.	Notes
<div style="text-align: center;">COLLUVIUM</div> <div style="text-align: center;">Very dense, dry, reddish brown, silty sand (SM) with cobbles/ boulders, micaceous</div> <div style="text-align: center;">Boulders</div> <div style="text-align: center;">5</div> <div style="text-align: center;">10</div> <div style="text-align: center;">15</div> <div style="text-align: center;">20</div> <div style="text-align: center;">25</div>	<div style="text-align: center;">Boulders</div> <div style="text-align: center;">With olive-gray mottling (with metamorphic clasts)</div> <div style="text-align: center;">Becomes pebbly</div> <div style="text-align: center;">Boulder (decomposed; leucogranodiorite)</div> <div style="text-align: center;">Boulder (metamorphic?); dark-colored cuttings</div>	<div style="text-align: center;">109</div> <div style="text-align: center;">50</div>				<div style="text-align: center;">B4-10.5ft</div> <div style="text-align: center;">B4-16ft</div>	
<div style="text-align: center;">Bottom of Boring at 19.5 feet</div> <div style="text-align: center;">Boring backfilled with 3/8-inch bentonite chips hydrated during placement.</div>							

Project No: 90532203-H400
Woodward-Clyde Consultants
Figure: A-2,12

Project: GREGORY CANYON		Log of Test Boring No: B-5	
Logged by: RKS		Checked by: <i>Jan</i>	
Drilling Equipment: Canterra CT 212, Air Rotary, 6.5" Tricone Ground Elev and Datum: Approximately 378', MSL VL Depth ATD: None encountered Date Started: 10-18-91 Date Completed: 10-18-91			

Depth, ft	Geologic Log	Material Description	Blow Counts	OVM/OVA (ppm)	Sample		Notes
					Type	No.	
		TOPSOIL Loose, dry to moist, dark reddish brown, silty, fine-grained sand (SM)	NR		RUN 1 RUN 2 RUN 3 RUN 4 RUN 5		60% recovery
		RESIDUAL SOIL Dense, moist, reddish brown, clayey sand (SC) with gravels and boulders					
5		OLDER COLLUVIUM Very dense, moist, reddish brown, silty sand with clay (SM) and gravels	NR				85% recovery
		Fine gravels					
10		Very dense, moist, reddish brown, silty sand (SM), slightly cemented					100% recovery
15		WEATHERED BEDROCK (TONALITE) Dark-colored, plutonic rock composed of quartz and feldspar with abundant biotite and hornblende Becomes moderately weathered	NR			80% recovery	
20						100% recovery	
		Becomes highly weathered, fractured and oxidized					
25		Bottom of Boring at 25 feet Boring backfilled with 3/8-inch bentonite chips hydrated during placement.					

Project No: 90532203-H400	Woodward-Clyde Consultants	Figure: A-2.13
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Log of Monitoring Well No: WCC-1 (B-6)

Checked by:

WL Elev: 309.48'

Date: 10-17-91 Time: 10:30 am

TOC Elev: 330.38'

Well Cover: Monument

Well Casing: 2" diam., Sch 40 PVC

Screen: 0.020" slotted

Date Completed: 10-19-91

Filter Pack: #2/16 Lonestar sand

Seal: No. 8 Granular
Bentonite (Enviroplug)

Project No: 90532203-H400	Woodward-Clyde Consultants	Figure: A-2.14
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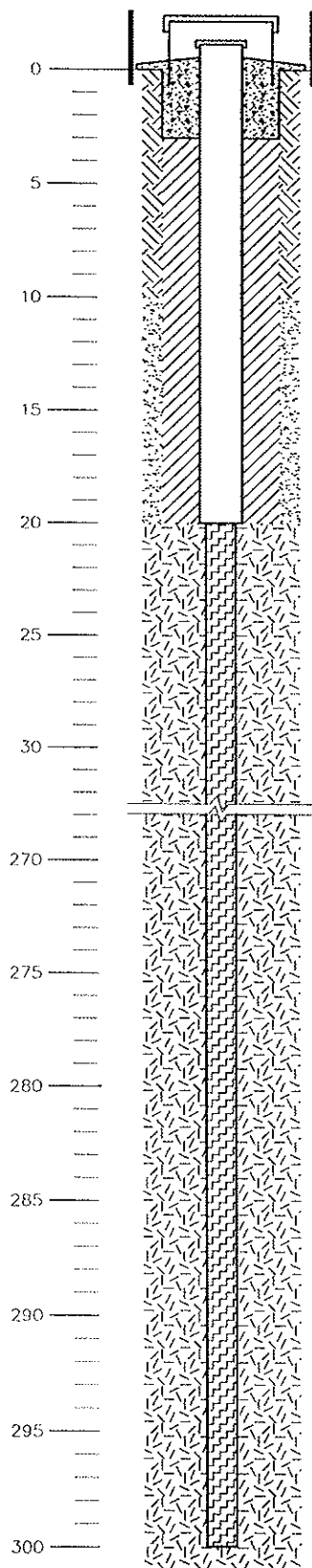
GeoLogic Associates
MONITORING WELL COMPLETION SUMMARY

WELL NO.: GLA-1

PAGE: 1 OF 1

JOB NO.: 9539
PROJECT: PROPOSED SAN DIEGO COUNTY LANDFILL
LOCATION: GREGORY CANYON, PALA AREA
INSPECTOR: T. REEDER
CHECKED BY: T. REEDER

ELEVATION GROUND LEVEL: 342.5 feet
ELEVATION TOP OF CASING: 343.72 feet
DATE STARTED: 11/19/96
DATE FINISHED: 11/20/96
TOTAL DEPTH: 300 feet



DRILLING SUMMARY:

Total Depth: 300 feet
Borehole diameter: 5.5 inches O.D.
Driller: Layne Cristensen

Rig: DUAL WALL REVERSE
Bit(s): CARBIDE BUTTON BIT

Drilling Fluid: Air

Protective Casing: N/A

WELL CONSTRUCTION DETAILS:

Casing: 6-inch diameter, flush threaded, Schedule 40 PVC (boring reamed to 8-inch diameter prior to placement of casing). (From +1.22 to 20 feet.)

Screen: NONE - OPEN HOLE. (From 20 to 300 feet.)

Bentonite Seal: Bentonite pellets. (From 3 to 20 feet.)

Filter Pack: NONE - FRACTURED ROCK.

Residual Soil. (From 0 to 10 feet.)

DECOMPOSED ROCK. (From 10 to 20 feet.)

Portland Type II cement with bentonite. (From 0 to 3 feet.)

WELL CONSTRUCTION LOG:

	Date	Start Time	Date	Finish Time
Drilling:	11/19/96	10:12	11/20/96	9:07
Coring:	-	-	-	-
Ream:	-	-	-	-
Geophys. Logging:	12/13/96	-	12/13/96	-
Casing Install:	11/19/96	10:36	11/19/96	12:14
Filter Placement:	-	-	-	-
Seal Placement:	-	-	-	-
Seal Placement 2nd:	-	-	-	-

WELL DEVELOPMENT LOG:

	Date	Start Time	Finish Time
Surge Block			
Air Lift Pumping			
Bail			
Total Gallons Removed:			

STABILIZATION TEST DATA:

Gallons	pH	Spec. Cond.	Temp (°F)

Comments:

WELL MONITORING DATA:

Date	Time	Reading	Corr.	Depth	SWL	By
11/20	6:30	99.5'	1.5'	234'	235.5'	TSR
12/16	-	37.1'	1.5'	296.4'	297.9'	LL

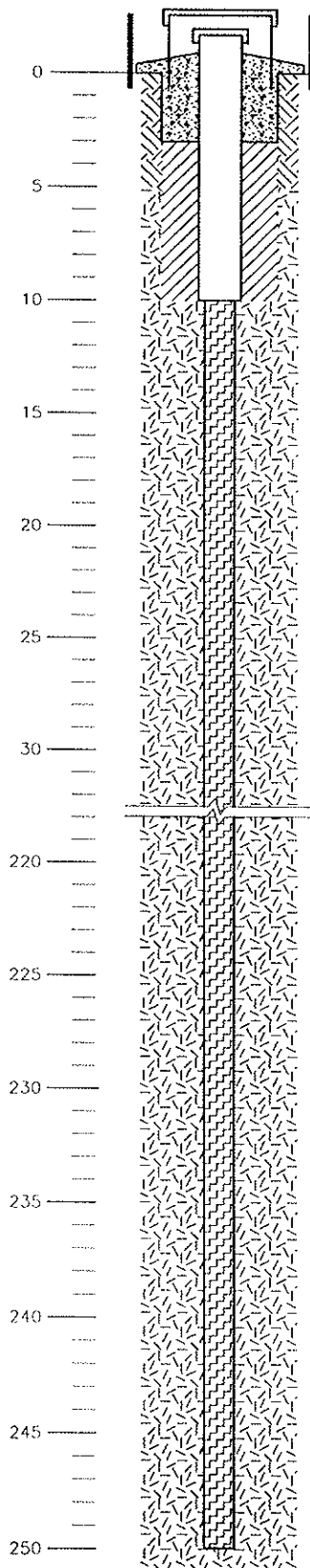
GeoLogic Associates
MONITORING WELL COMPLETION SUMMARY

WELL NO.: GLA-2

PAGE: 1 OF 1

JOB NO.: 9539
PROJECT: PROPOSED SAN DIEGO COUNTY LANDFILL
LOCATION: GREGORY CANYON, PALA AREA
INSPECTOR: T. REEDER
CHECKED BY: T. REEDER

ELEVATION GROUND LEVEL: 377.1 feet
ELEVATION TOP OF CASING: 379.45 feet
DATE STARTED: 11/18/96
DATE FINISHED: 11/19/96
TOTAL DEPTH: 250 feet



DRILLING SUMMARY:


Total Depth: 250 feet
Borehole diameter: 5.5 inches O.D.
Driller: Layne Cristensen


Rig: DUAL WALL REVERSE
Bit(s): CARBIDE BUTTON BIT


Drilling Fluid: Air


Protective Casing: N/A


WELL CONSTRUCTION DETAILS:


 **Casing:** 6-inch diameter, flush threaded, Schedule 40 PVC (boring reamed to 8-inch diameter prior to placement of casing). (From +2.35 to 10 feet.)

 **Screen:** NONE - OPEN HOLE. (From 10 to 250 feet.)

 **Bentonite Seal:** Bentonite pellets. (From 3 to 10 feet.)

 **Filter Pack:** NONE - FRACTURED ROCK.

 **Residual Soil.** (From 0 to 5 feet.)

 **Portland Type II cement with bentonite.** (From 0 to 3 feet.)

WELL CONSTRUCTION LOG:

	Date	Start Time	Finish Date	Finish Time
Drilling:	11/18/96	11:20	11/19/96	8:19
Coring:	-	-	-	-
Ream:	-	-	-	-
Geophys. Logging:	12/12/96	-	12/12/96	-
Casing Install:	11/18/96	11:50	11/18/96	12:48
Filter Placement:	-	-	-	-
Seal Placement:	-	-	-	-
Seal Placement 2nd:	-	-	-	-

WELL DEVELOPMENT LOG:

	Date	Start Time	Finish Time
Surge Block			
Air Lift Pumping			
Bail			
Total Gallons Removed:			

STABILIZATION TEST DATA:

Gallons	pH	Spec. Cond.	Temp (°F)

Comments:

WELL MONITORING DATA:

Date	Time	Reading	Corr.	Depth	SWL	By
11/19	6:40	127.5'	1.5'	126'	247.5'	TSR
11/19	15:05	105'	1.5'	103.5'	270'	TSR
11/20	10:03	73.8'	1.5'	72.3'	301.2'	TSR
12/16	-	69.73'	1.5'	68.23'	305.27'	LL

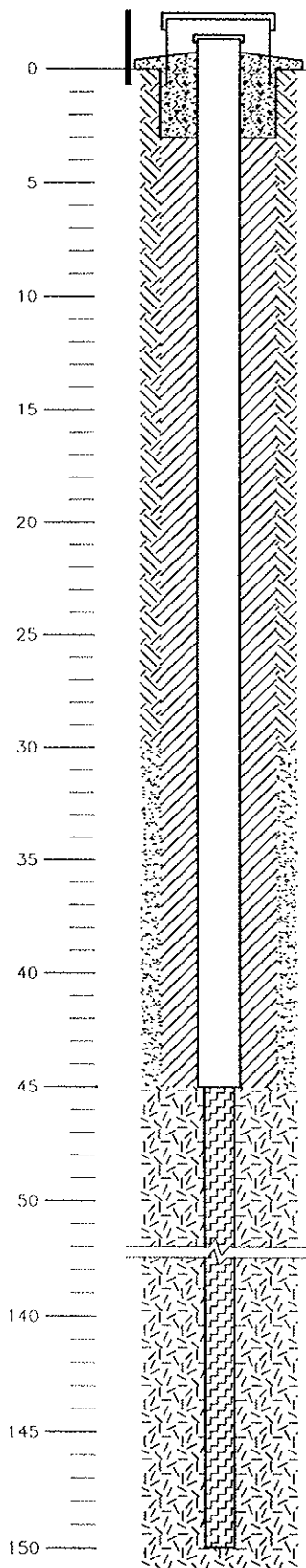
GeoLogic Associates
MONITORING WELL COMPLETION SUMMARY

WELL NO.: GLA-3

PAGE: 1 OF 1

JOB NO.: 9539
PROJECT: PROPOSED SAN DIEGO COUNTY LANDFILL
LOCATION: GREGORY CANYON, PALA AREA
INSPECTOR: T. REEDER
CHECKED BY: T. REEDER

ELEVATION GROUND LEVEL: 330.6 feet
ELEVATION TOP OF CASING: 332.02 feet
DATE STARTED: 11/25/96
DATE FINISHED: 11/26/96
TOTAL DEPTH: 150 feet



DRILLING SUMMARY:


Total Depth: 150 feet
Borehole diameter: 5.5 inches O.D.
Driller: Layne Cristensen


Rig: DUAL WALL REVERSE
Bit(s): CARBIDE BUTTON BIT

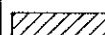
Drilling Fluid: Air

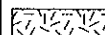
Protective Casing: N/A

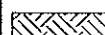
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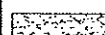
 **Casing: 6-inch diameter, flush threaded, Schedule 40 PVC (boring reamed to 8-inch diameter prior to placement of casing). (From +1.42 to 45 feet.)**


 **Screen: NONE - OPEN HOLE. (From 45 to 150 feet.)**

 **Bentonite Seal: Bentonite pellets. (From 3 to 45 feet.)**

 **Filter Pack: NONE - FRACTURED ROCK.**

 **ALLUVIUM/COLLUVIUM. (From 0 to 30 feet.)**

 **DECOMPOSED ROCK. (From 30 to 45 feet.)**

 **Portland Type II cement with bentonite. (From 0 to 3 feet.)**

WELL CONSTRUCTION LOG:

	Date	Start Time	Date	Finish Time
Drilling:	11/25/96	12:15	11/26/96	7:31
Coring:	-	-	-	-
Ream:	-	-	-	-
Geophys. Logging:	12/14/96	-	12/14/96	-
Casing Install:	11/25/96	12:45	11/25/96	15:33
Filter Placement:	-	-	-	-
Seal Placement:	-	-	-	-
Seal Placement 2nd:	-	-	-	-

WELL DEVELOPMENT LOG:

	Date	Start Time	Finish Time
Surge Block			
Air Lift Pumping			
Bail			
Total Gallons Removed:			

STABILIZATION TEST DATA:

Gallons	pH	Spec. Cond.	Temp (°F)

Comments:

WELL MONITORING DATA:

Date	Time	Reading	Corr.	Depth	SWL	By
11/26	6:45	21'	1.5'	19.5'	309'	TSR
12/16	-	23.84'	1.5'	22.34'	306.16'	LL

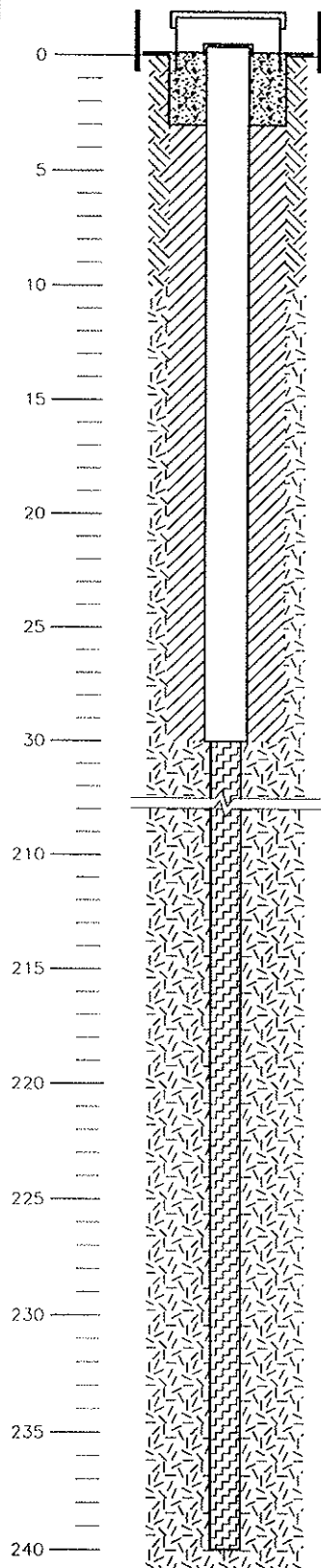
GeoLog Associates
MONITORING WELL COMPLETION SUMMARY

WELL NO.: GLA-4

PAGE: 1 OF 1

JOB NO.: 9539
PROJECT: PROPOSED SAN DIEGO COUNTY LANDFILL
LOCATION: GREGORY CANYON, PALA AREA
INSPECTOR: T. REEDER/M. VINCENT
CHECKED BY: T. REEDER

ELEVATION GROUND LEVEL: 904.9 feet
ELEVATION TOP OF CASING: 904.99 feet
DATE STARTED: 11/26/96
DATE FINISHED: 11/27/96
TOTAL DEPTH: 240 feet



DRILLING SUMMARY:


Total Depth: 240 feet
Borehole diameter: 5.5 inches O.D.
Driller: Layne Cristensen


Rig: DUAL WALL REVERSE
Bit(s): CARBIDE BUTTON BIT


Drilling Fluid: Air

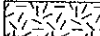
Protective Casing: N/A


WELL CONSTRUCTION DETAILS:


 **Casing: 6-inch diameter, flush threaded, Schedule 40 PVC (boring reamed to 8-inch diameter prior to placement of casing). (From +0.09 to 30 feet.)**

 **Screen: NONE - OPEN HOLE. (From 30 to 240 feet.)**

 **Bentonite Seal: Bentonite pellets. (From 3 to 30 feet.)**

 **Filter Pack: NONE - FRACTURED ROCK.**

 **Residual Soil. (From 0 to 10 feet.)**

 **Portland Type II cement with bentonite. (From 0 to 3 feet.)**

WELL CONSTRUCTION LOG:

	Date	Start Time	Date	Finish Time
Drilling:	11/26/96	-	11/27/96	11:08
Coring:	-	-	-	-
Ream:	-	-	-	-
Geophys. Logging:	12/17/96	-	12/17/96	-
Casing Install:	11/26/96	-	11/26/96	-
Filter Placement:	-	-	-	-
Seal Placement:	-	-	-	-
Seal Placement 2nd:	-	-	-	-

WELL DEVELOPMENT LOG:

	Date	Start Time	Finish Time
Surge Block			
Air Lift Pumping			
Bail			
Total Gallons Removed:			

STABILIZATION TEST DATA:

Gallons	pH	Spec. Cond.	Temp (°F)

Comments:

WELL MONITORING DATA:

Date	Time	Reading	Corr.	Depth	SWL	By
12/02	6:55	103.2'	1.5'	101.7'	801.8'	TSR
12/16	-	149.93'	1.5'	148.43'	755.07'	LL

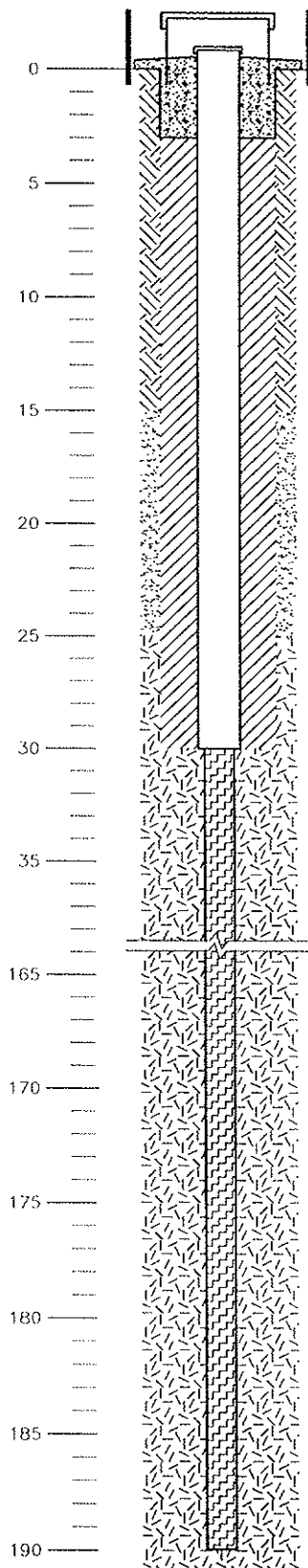
GeoLogic Associates
MONITORING WELL COMPLETION SUMMARY

WELL NO.: GLA-5

PAGE: 1 OF 1

JOB NO.: 9539
PROJECT: PROPOSED SAN DIEGO COUNTY LANDFILL
LOCATION: GREGORY CANYON, PALA AREA
INSPECTOR: T. REEDER
CHECKED BY: T. REEDER

ELEVATION GROUND LEVEL: 927.1 feet
ELEVATION TOP OF CASING: 927.92 feet
DATE STARTED: 11/20/96
DATE FINISHED: 11/21/96
TOTAL DEPTH: 190 feet



DRILLING SUMMARY:

Total Depth: 190 feet
Borehole diameter: 5.5 inches O.D.
Driller: Layne Cristensen

Rig: DUAL WALL REVERSE
Bit(s): CARBIDE BUTTON BIT

Drilling Fluid: Air

Protective Casing: N/A

WELL CONSTRUCTION DETAILS:

Casing: 6-inch diameter, flush threaded, Schedule 40 PVC (boring reamed to 8-inch diameter prior to placement of casing). (From +0.82 to 30 feet.)

Screen: NONE - OPEN HOLE. (From 30 to 190 feet.)

Bentonite Seal: Bentonite pellets. (From 3 to 30 feet.)

Filter Pack: NONE - FRACTURED ROCK.

COLLUVIUM/Residual Soil. (From 0 to 15 feet.)

DECOMPOSED ROCK. (From 15 to 25 feet.)

Portland Type II cement with bentonite. (From 0 to 3 feet.)

WELL CONSTRUCTION LOG:

	Date	Start Time	Date	Finish Time
Drilling:	11/20/96	11:20	11/21/96	9:47
Coring:	-	-	-	-
Ream:	-	-	-	-
Geophys. Logging:	12/16/96	-	12/16/96	-
Casing Install:	11/20/96	-	11/20/96	15:57
Filter Placement:	-	-	-	-
Seal Placement:	-	-	-	-
Seal Placement 2nd:	-	-	-	-

WELL DEVELOPMENT LOG:

	Date	Start Time	Finish Time
Surge Block			
Air Lift Pumping			
Bail			
Total Gallons Removed:			

STABILIZATION TEST DATA:

Gallons	pH	Spec. Cond.	Temp (°F)

Comments:

WELL MONITORING DATA:

Date	Time	Reading	Corr.	Depth	SWL	By
11/21	6:30	41'	1.5'	39.5'	889'	TSR
12/16	-	42.57'	1.5'	41.07'	887.43'	LL

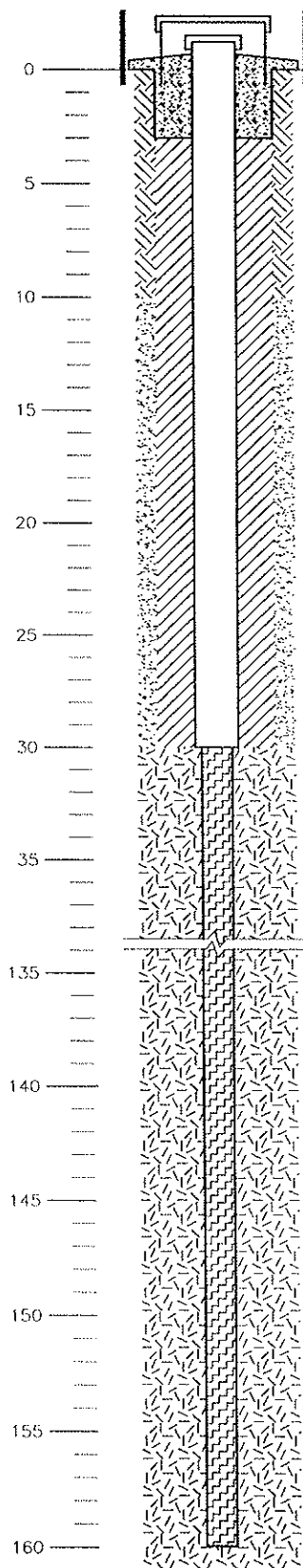
GeoLogic Associates
MONITORING WELL COMPLETION SUMMARY

WELL NO.: GLA-7

PAGE: 1 OF 1

JOB NO.: 9539
PROJECT: PROPOSED SAN DIEGO COUNTY LANDFILL
LOCATION: GREGORY CANYON, PALA AREA
INSPECTOR: T. REEDER
CHECKED BY: T. REEDER

ELEVATION GROUND LEVEL: 401.6 feet
ELEVATION TOP OF CASING: 402.85 feet
DATE STARTED: 11/21/96
DATE FINISHED: 11/22/96
TOTAL DEPTH: 160 feet



DRILLING SUMMARY:


Total Depth: 160 feet
Borehole diameter: 5.5 inches O.D.
Driller: Layne Cristensen


Rig: DUAL WALL REVERSE
Bit(s): CARBIDE BUTTON BIT

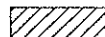
Drilling Fluid: Air

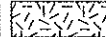
Protective Casing: N/A


WELL CONSTRUCTION DETAILS:

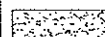
 **Casing:** 6-inch diameter, flush threaded, Schedule 40 PVC (boring reamed to 8-inch diameter prior to placement of casing). (From +1.25 to 30 feet.)

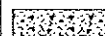
 **Screen:** NONE - OPEN HOLE. (From 30 to 160 feet.)

 **Bentonite Seal:** Bentonite pellets. (From 3 to 30 feet.)

 **Filter Pack:** NONE - FRACTURED ROCK.

 **COLLUVIUM.** (From 0 to 10 feet.)

 **DECOMPOSED ROCK.** (From 10 to 30 feet.)

 **Portland Type II cement with bentonite.** (From 0 to 3 feet.)

WELL CONSTRUCTION LOG:

	Date	Start Time	Date	Finish Time
Drilling:	11/21/96	13:55	11/22/96	10:21
Coring:	-	-	-	-
Ream:	-	-	-	-
Geophys. Logging:	12/19/96	-	12/19/96	-
Casing Install:	11/21/96	-	11/21/96	-
Filter Placement:	-	-	-	-
Seal Placement:	-	-	-	-
Seal Placement 2nd:	-	-	-	-

WELL DEVELOPMENT LOG:

	Date	Start Time	Finish Time
Surge Block			
Air Lift Pumping			
Bail			
Total Gallons Removed:			

STABILIZATION TEST DATA:

Gallons	pH	Spec. Cond.	Temp (°F)

Comments:

WELL MONITORING DATA:

Date	Time	Reading	Corr.	Depth	SWL	By
12/16	-	34.82'	1.5'	33.32'		TSR

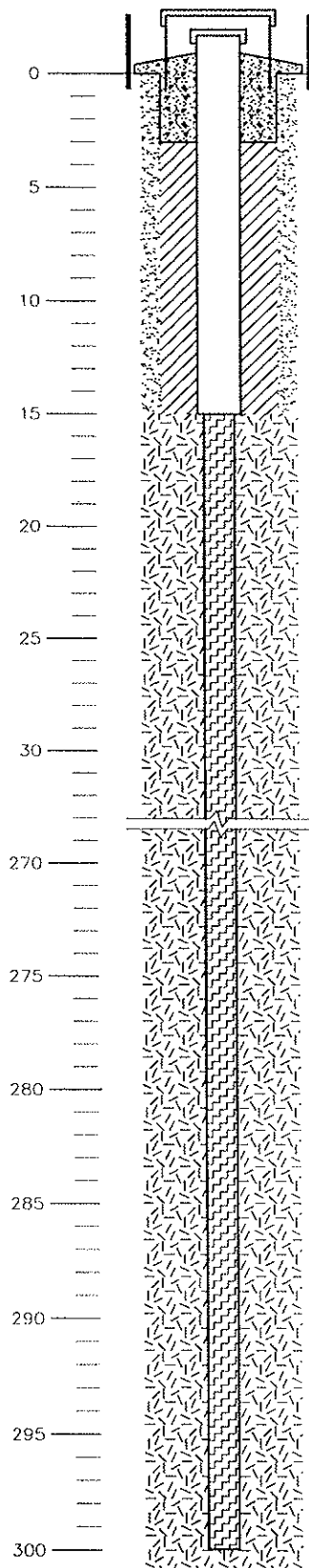
GeoLogic Associates
MONITORING WELL COMPLETION SUMMARY

WELL NO.: GLA-8

PAGE: 1 OF 1

JOB NO.: 9539
 PROJECT: PROPOSED SAN DIEGO COUNTY LANDFILL
 LOCATION: GREGORY CANYON, PALA AREA
 INSPECTOR: M. VINCENT/T. REEDER
 CHECKED BY: T. REEDER

ELEVATION GROUND LEVEL: 632.7 feet
 ELEVATION TOP OF CASING: 633.11 feet
 DATE STARTED: 11/24/96
 DATE FINISHED: 11/25/96
 TOTAL DEPTH: 300 feet



DRILLING SUMMARY:

Total Depth: 300 feet
 Borehole diameter: 5.5 inches O.D.
 Driller: Layne Cristensen

Rig: DUAL WALL REVERSE
 Bit(s): CARBIDE BUTTON BIT

Drilling Fluid: Air

Protective Casing: N/A

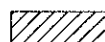
WELL CONSTRUCTION DETAILS:



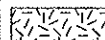
Casing: 6-inch diameter, flush threaded, Schedule 40 PVC (boring reamed to 8-inch diameter prior to placement of casing).
 (From +1.41 to 15 feet.)



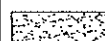
Screen: NONE - OPEN HOLE.
 (From 15 to 300 feet.)



Bentonite Seal: Bentonite pellets.
 (From 3 to 15 feet.)



Filter Pack: NONE - FRACTURED ROCK.



DECOMPOSED ROCK.
 (From 0 to 15 feet.)



Portland Type II cement with bentonite.
 (From 0 to 3 feet.)

WELL CONSTRUCTION LOG:

	Start		Finish	
	Date	Time	Date	Time
Drilling:	11/24/96	9:20	11/25/96	11:17
Coring:	-	-	-	-
Ream:	-	-	-	-
Geophys. Logging:	12/18/96	-	12/18/96	-
Casing Install:	11/24/96	-	11/24/96	-
Filter Placement:	-	-	-	-
Seal Placement:	-	-	-	-
Seal Placement 2nd:	-	-	-	-

WELL DEVELOPMENT LOG:

	Date	Start Time	Finish Time
Surge Block			
Air Lift Pumping			
Bail			
Total Gallons Removed:			

STABILIZATION TEST DATA:

Gallons	pH	Spec. Cond.	Temp (°F)

Comments:

WELL MONITORING DATA:

Date	Time	Reading	Corr.	Depth	SWL	By
11/25	6:45	61'	1.5'	59.5'	559'	TSR
12/16	-	62.40'	1.5'	60.9'	557.6'	LL

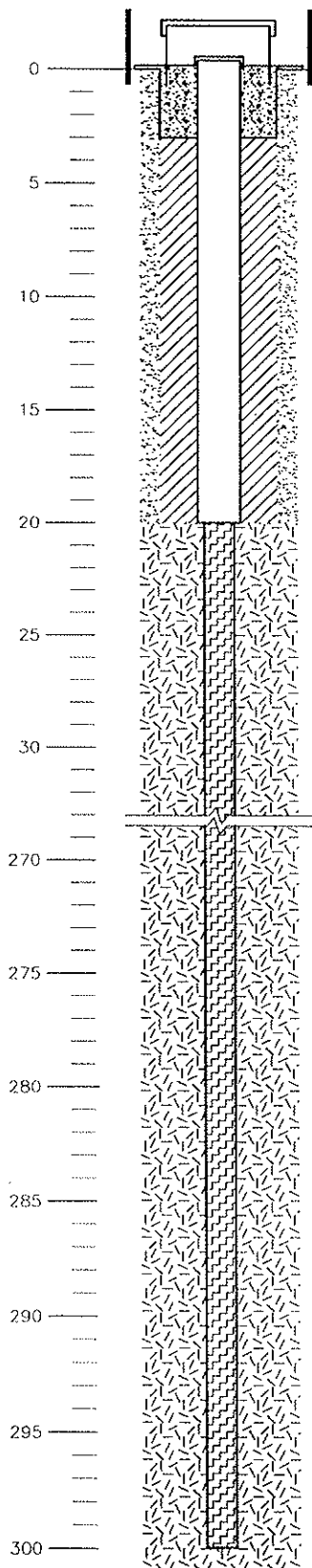
GeoLogic Associates
MONITORING WELL COMPLETION SUMMARY

WELL NO.: GLA-9

PAGE: 1 OF 1

JOB NO.: 9539
PROJECT: PROPOSED SAN DIEGO COUNTY LANDFILL
LOCATION: GREGORY CANYON, PALA AREA
INSPECTOR: M. VINCENT/T. REEDER
CHECKED BY: T. REEDER

ELEVATION GROUND LEVEL: 615.4 feet
ELEVATION TOP OF CASING: 615.61 feet
DATE STARTED: 12/05/96
DATE FINISHED: 12/07/96
TOTAL DEPTH: 300 feet



DRILLING SUMMARY:


Total Depth: 300 feet
Borehole diameter: 5.5 inches O.D.
Driller: Layne Cristensen

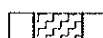
Rig: DUAL WALL REVERSE
Bit(s): CARBIDE BUTTON BIT

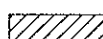
Drilling Fluid: Air

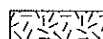
Protective Casing: N/A

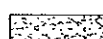
WELL CONSTRUCTION DETAILS:

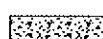
 **Casing:** 6-inch diameter, flush threaded, Schedule 40 PVC (boring reamed to 8-inch diameter prior to placement of casing). (From +0.21 to 20 feet.)

 **Screen:** NONE - OPEN HOLE. (From 20 to 300 feet.)

 **Bentonite Seal:** Bentonite pellets. (From 3 to 20 feet.)

 **Filter Pack:** NONE - FRACTURED ROCK.

 **DECOMPOSED ROCK.** (From 0 to 20 feet.)

 **Portland Type II cement with bentonite.** (From 0 to 3 feet.)

WELL CONSTRUCTION LOG:

	Date	Start Time	Date	Finish Time
Drilling:	12/05/96	-	12/07/96	8:57
Coring:	-	-	-	-
Ream:	-	-	-	-
Geophys. Logging:	N/A	-	N/A	-
Casing Install:	-	-	-	-
Filter Placement:	-	-	-	-
Seal Placement:	-	-	-	-
Seal Placement 2nd:	-	-	-	-

WELL DEVELOPMENT LOG:

	Date	Start Time	Finish Time
Surge Block			
Air Lift Pumping			
Bail			

Total Gallons Removed:

STABILIZATION TEST DATA:

Gallons	pH	Spec. Cond.	Temp (°F)

Comments:

WELL MONITORING DATA:

Date	Time	Reading	Corr.	Depth	SWL	By
12/07	8:57	DRY	1.5'	N/A	N/A	TSR
12/16	-	DRY	1.5'	N/A	N/A	LL

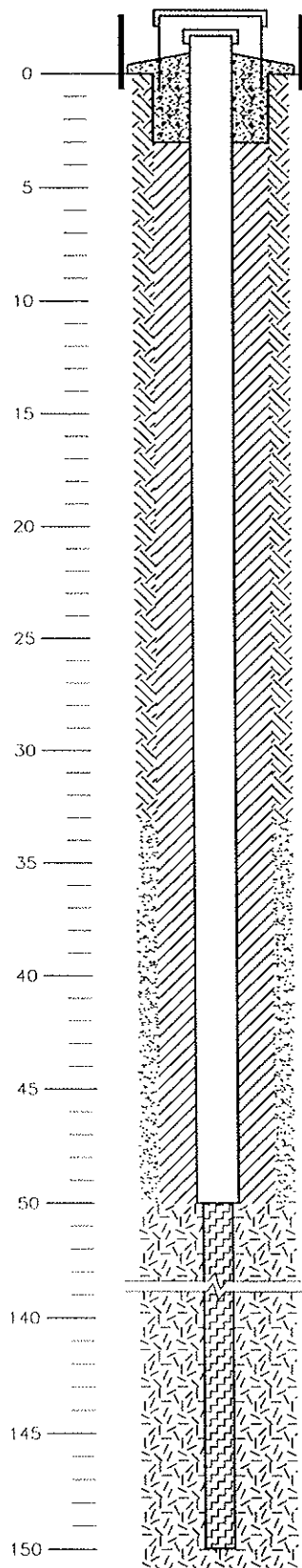
GeoLogic Associates
MONITORING WELL COMPLETION SUMMARY

WELL NO.: GLA-10

PAGE: 1 OF 1

JOB NO.: 9539
PROJECT: PROPOSED SAN DIEGO COUNTY LANDFILL
LOCATION: GREGORY CANYON, PALA AREA
INSPECTOR: M. VINCENT/T. REEDER
CHECKED BY: T. REEDER

ELEVATION GROUND LEVEL: 324.6 feet
ELEVATION TOP OF CASING: 326.59 feet
DATE STARTED: 12/03/96
DATE FINISHED: 12/05/96
TOTAL DEPTH: 150 feet



DRILLING SUMMARY:


Total Depth: 150 feet
Borehole diameter: 5.5 inches O.D.
Driller: Layne Cristensen


Rig: DUAL WALL REVERSE
Bit(s): CARBIDE BUTTON BIT

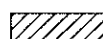
Drilling Fluid: Air

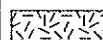
Protective Casing: N/A

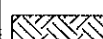
WELL CONSTRUCTION DETAILS:

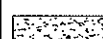
 **Casing: 6-inch diameter, flush threaded, Schedule 40 PVC (boring reamed to 8-inch diameter prior to placement of casing). (From +1.99 to 50 feet.)**


 **Screen: NONE - OPEN HOLE. (From 50 to 150 feet.)**

 **Bentonite Seal: Bentonite pellets. (From 3 to 50 feet.)**

 **Filter Pack: NONE - FRACTURED ROCK.**

 **COLLUVIUM. (From 0 to 33 feet.)**

 **DECOMPOSED ROCK. (From 33 to 50 feet.)**

 **Portland Type II cement with bentonite. (From 0 to 3 feet.)**

WELL CONSTRUCTION LOG:

	Date	Start Time	Date	Finish Time
Drilling:	12/03/96	11:57	12/05/96	11:06
Coring:	-	-	-	-
Ream:	-	-	-	-
Geophys. Logging:	12/15/96	-	12/15/96	-
Casing Install:	12/03/96	-	12/03/96	-
Filter Placement:	-	-	-	-
Seal Placement:	-	-	-	-
Seal Placement 2nd:	-	-	-	-

WELL DEVELOPMENT LOG:

	Date	Start Time	Finish Time
Surge Block			
Air Lift Pumping			
Bail			

Total Gallons Removed:

STABILIZATION TEST DATA:

Gallons	pH	Spec. Cond.	Temp (°F)

Comments:

WELL MONITORING DATA:

Date	Time	Reading	Corr.	Depth	SWL	By
12/03	-	17'	2'	15'	308'	MV
12/16	-	22.2'	2'	20.2'	300.8'	LL

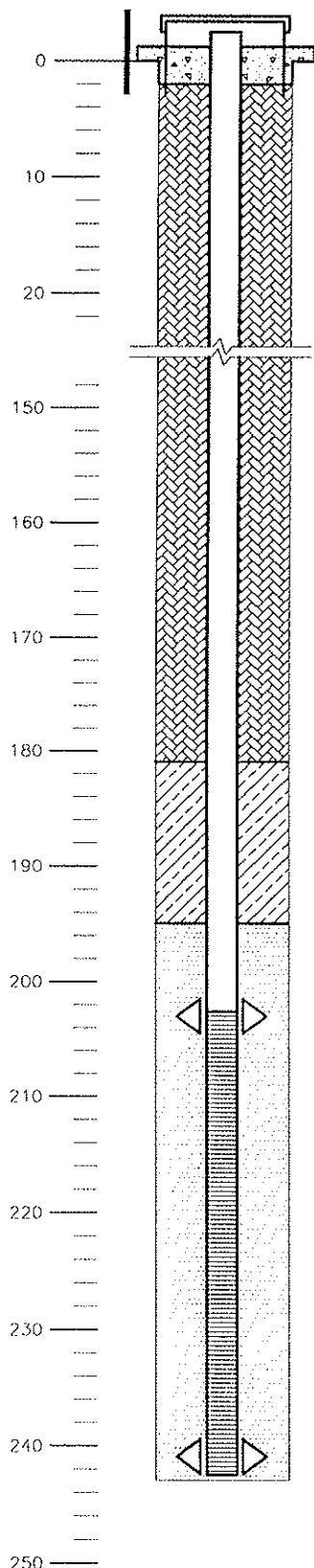
GeoLogic Associates
MONITORING WELL COMPLETION SUMMARY

WELL NO.: GLA-11

PAGE: 1 OF 1

JOB NO.: 9539
PROJECT: DETECTION MONITORING PROGRAM
LOCATION: GREGORY CANYON LANDFILL
INSPECTOR: W. LOPEZ, CEG
CHECKED BY: S. BATTELLE, CHG

ELEVATION GROUND LEVEL: 775.22
ELEVATION TOP OF CASING: 777.32
DATE STARTED: 11/30/99
DATE FINISHED: 12/02/99
TOTAL DEPTH: 242.5 feet



DRILLING SUMMARY:


Total Depth: 243 feet
Borehole diameter: 6.5"


Driller: Water Development Corporation
Rig: Dresser T-70
Bit(s): Downhole Hammer


Drilling Fluid: Air


Protective Casing: None


WELL CONSTRUCTION DETAILS:


 **Casing:** 2" diameter Sch. 40 PVC with flush threaded joints. (From +2.1 to 202.5 feet.)


 **Screen:** 2" diameter Sch. 40 PVC with 0.020" slots and flush threaded joints. (From 202.5 to 242.5 feet.)

 **Grout Seal:** Portland type I-II neat cement with 5% bentonite. (From 2 to 181.0 feet.)

 **Bentonite Seal:** Medium bentonite chips. (From 181.0 to 195.0 feet.)

 **Filter Pack:** #3 Monterey Sand. (From 195 to 243 feet.)

 **Centralizer:** Stainless steel. (At 202 and 242 feet.)

 **Concrete**

WELL CONSTRUCTION LOG:

	Date	Start Time	Date	Finish Time
Drilling:	11/30/99	8:20	11/30/99	15:27
Coring:	-	-	-	-
Casing Install:	12/1/99	16:00	12/1/99	16:33
Filter Placement:	12/1/99	16:37	12/1/99	16:44
Seal Placement: (Bentonite Chips)	12/1/99	16:44	12/1/99	16:58
Seal Placement 2nd: (Grout)	12/2/99	10:41	12/2/99	11:10

WELL DEVELOPMENT LOG:

	Date	Start Time	Finish Time
Surge Block	12/7/99	11:10	11:50
Air Lift Pumping			
Other - Bailor	12/7/99	11:50	16:30
Total Gallons Removed: 75			

STABILIZATION TEST DATA:

Gallons	pH	Spec. Cond.	Temp (°F)

Comments:

WELL MONITORING DATA:

Date	Time	Reading	Corr.	Depth	SWL	By
11/30/99	16:30			231' bgs		WBL
12/07/99	11:10			191.5' bgs		WBL

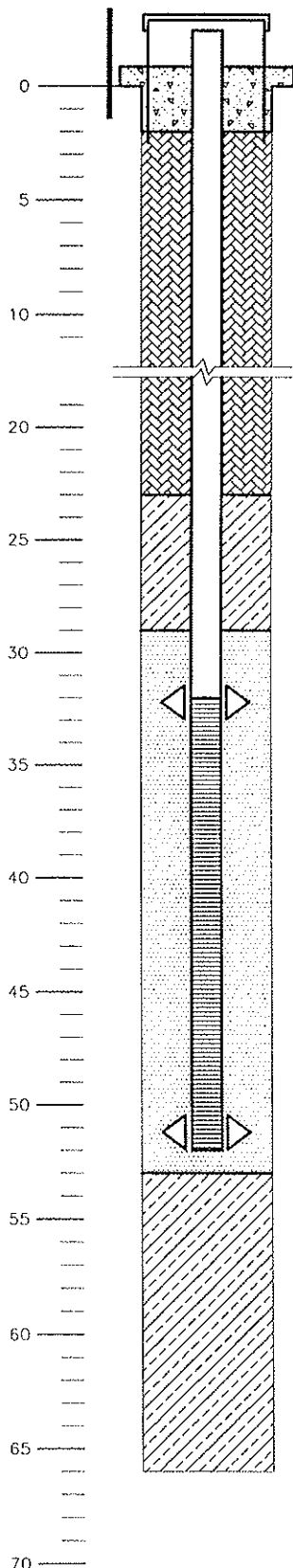
GeoLogic Associates
MONITORING WELL COMPLETION SUMMARY

WELL NO.: GLA-12

PAGE: 1 OF 1

JOB NO.: 9539
PROJECT: DETECTION MONITORING PROGRAM
LOCATION: GREGORY CANYON LANDFILL
INSPECTOR: W. LOPEZ, CEG
CHECKED BY: S. BATTELLE, CHG

ELEVATION GROUND LEVEL: 343.91
ELEVATION TOP OF CASING: 345.79
DATE STARTED: 11/24/99
DATE FINISHED: 11/24/99
TOTAL DEPTH: 52 feet



DRILLING SUMMARY:








Total Depth: 66 feet
Borehole diameter: 6-5/8"

Driller: Water Development Corporation
Rig: Dresser T-70
Bit(s): Tri-cone/Downhole Hammer

Drilling Fluid: Air

Protective Casing: 9-7/8" ø steel.

WELL CONSTRUCTION DETAILS:

-  **Casing:** 2" diameter Sch. 40 PVC with flush threaded joints. (From +1.88 to 32 feet.)
-  **Screen:** 2" diameter Sch. 40 PVC with 0.020" slots and flush threaded joints. (From 32 to 52 feet.)
-  **Grout Seal:** Portland type I-II neat cement with 5% bentonite. (From 2 to 23 feet.)
-  **Bentonite Seal:** Medium bentonite chips. (From 23 to 29 feet and from 53 to 66 feet.)
-  **Filter Pack:** #3 Monterey Sand. (From 29 to 53 feet.)
-  **Centralizer:** Stainless steel. (At 32 and 52 feet.)
-  **Concrete**

WELL CONSTRUCTION LOG:

	Date	Start Time	Date	Finish Time
Drilling:	-	-	-	-
Coring:	-	-	-	-
Casing Install:	11/24/99	15:03	11/24/99	15:09
Filter Placement:	11/24/99	15:10	11/24/99	15:15
Seal Placement: (Bentonite Chips)	11/24/99	14:58 15:15	11/24/99	15:03 15:16
Seal Placement 2nd: (Grout)	11/24/99	15:35	11/24/99	15:40

WELL DEVELOPMENT LOG:

	Date	Start Time	Finish Time
Surge Block	12/7/99	7:20	8:05
Air Lift Pumping			
Other - Bailer	12/7/99	8:05	10:30

Total Gallons Removed: 40

STABILIZATION TEST DATA:

Gallons	pH	Spec. Cond.	Temp (°F)

Comments:

WELL MONITORING DATA:

Date	Time	Reading	Corr.	Depth	SWL	By
11/24/99	13:00			36.7' bgs		WBL
12/07/99	7:20			35.1' bgs		WBL

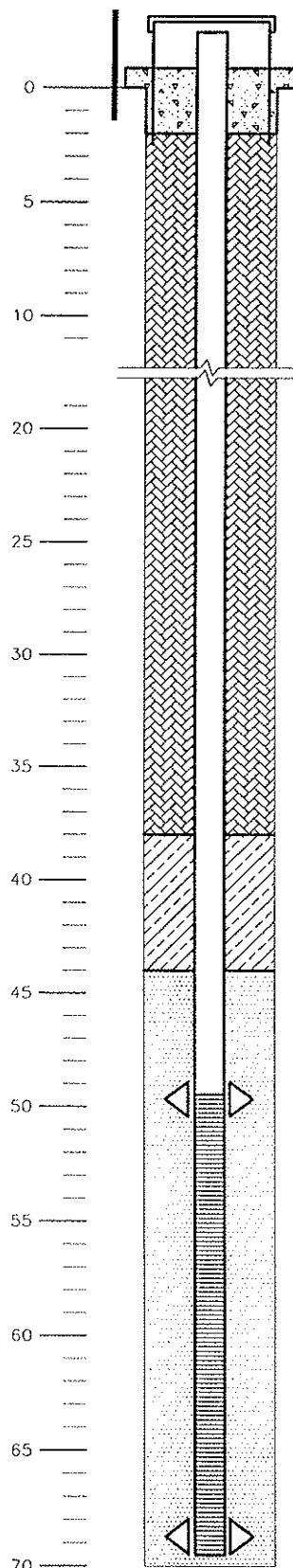
GeoLogic Associates
MONITORING WELL COMPLETION SUMMARY

WELL NO.: GLA-13

PAGE: 1 OF 1

JOB NO.: 9539
PROJECT: DETECTION MONITORING PROGRAM
LOCATION: GREGORY CANYON LANDFILL
INSPECTOR: W. LOPEZ, CEG
CHECKED BY: S. BATTELLE, CHG

ELEVATION GROUND LEVEL: 355.90
ELEVATION TOP OF CASING: 358.15
DATE STARTED: 11/22/99
DATE FINISHED: 11/23/99
TOTAL DEPTH: 69.5 feet



DRILLING SUMMARY:

Total Depth: 70 feet
Borehole diameter: 6.5"

Driller: Water Development Corporation
Rig: Dresser T-70
Bit(s): Tri-cone

Drilling Fluid: Air

Protective Casing: 9-7/8" ϕ steel.

WELL CONSTRUCTION DETAILS:

Casing: 2" diameter Sch. 40 PVC with flush threaded joints. (From +2.25 to 49.5 feet.)

Screen: 2" diameter Sch. 40 PVC with 0.020" slots and flush threaded joints. (From 49.5 to 69.5 feet.)

Grout Seal: Portland type I-II neat cement with 5% bentonite. (From 2 to 38 feet.)

Bentonite Seal: Medium bentonite chips. (From 38 to 44 feet.)

Filter Pack: #3 Monterey Sand. (From 44 to 70 feet.)

Centralizer: Stainless steel. (At 49 and 69 feet.)

Concrete

WELL CONSTRUCTION LOG:

	Date	Start Time	Date	Finish Time
Drilling:	11/22/99	15:00	11/23/99	8:22
Coring:	-	-	-	-
Casing Install:	11/23/99	10:26	11/23/99	10:35
Filter Placement:	11/23/99	10:35	11/23/99	10:39
Seal Placement: (Bentonite Chips)	11/23/99	10:40	11/23/99	10:42
Seal Placement 2nd: (Grout)	11/23/99	10:57	11/23/99	11:13

WELL DEVELOPMENT LOG:

	Date	Start Time	Finish Time
Surge Block	12/6/99	14:00	14:45
Air Lift Pumping			
Other - Bailer	12/6/99	14:45	16:30

Total Gallons Removed: 45

STABILIZATION TEST DATA:

Gallons	pH	Spec. Cond.	Temp (°F)

Comments:

WELL MONITORING DATA:

Date	Time	Reading	Corr.	Depth	SWL	By
11/23/99	7:00			49.7' bgs		WBL
12/06/99	14:18			47.0' bgs		WBL

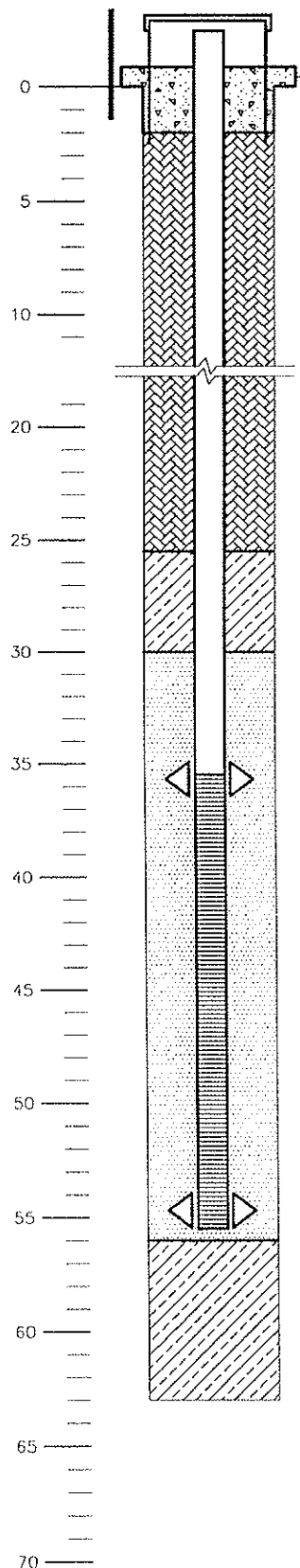
GeoLogic Associates
MONITORING WELL COMPLETION SUMMARY

WELL NO.: GLA-14

PAGE: 1 OF 1

JOB NO.: 9539
PROJECT: DETECTION MONITORING PROGRAM
LOCATION: GREGORY CANYON LANDFILL
INSPECTOR: W. LOPEZ, CEG
CHECKED BY: S. BATTELLE, CHG








ELEVATION GROUND LEVEL: 332.21
ELEVATION TOP OF CASING: 334.13
DATE STARTED: 11/21/99
DATE FINISHED: 11/22/99
TOTAL DEPTH: 55.5 feet



DRILLING SUMMARY:

Total Depth: 63 feet
Borehole diameter: 9-7/8"
Driller: Water Development Corporation
Rlg: Dresser T-70
Bit(s): Tri-cone
Drilling Fluid: Air
Protective Casing: 9-7/8" ø steel.

WELL CONSTRUCTION DETAILS:

-  **Casing:** 2" diameter Sch. 40 PVC with flush threaded joints. (From +1.92 to 35.5 feet.)
-  **Screen:** 2" diameter Sch. 40 PVC with 0.020" slots and flush threaded joints. (From 35.5 to 55.5 feet.)
-  **Grout Seal:** Portland type I-II neat cement with 5% bentonite. (From 2 to 25.5 feet.)
-  **Bentonite Seal:** Medium bentonite chips. (From 25.5 to 30 feet and from 56 to 63 feet.)
-  **Filter Pack:** #3 Monterey Sand. (From 30 to 56 feet.)
-  **Centralizer:** Stainless steel. (At 35 and 55 feet.)
-  **Concrete**

WELL CONSTRUCTION LOG:

	Date	Start Time	Finish Time
Drilling:	11/21/99	7:35	11/21/99 16:15
Coring:	-	-	-
Casing Install:	11/22/99	8:23	11/22/99 8:28
Filter Placement:	11/22/99	8:30	11/22/99 8:36
Seal Placement: (Bentonite Chips)	11/22/99	7:52 8:38	11/22/99 7:54 8:40
Seal Placement 2nd: (Grout)	11/22/99	9:05	11/22/99 9:15

WELL DEVELOPMENT LOG:

	Date	Start Time	Finish Time
Surge Block	12/6/99	9:35	10:20
Air Lift Pumping			
Other - Bailer	12/6/99	10:20	12:35

Total Gallons Removed: 45

STABILIZATION TEST DATA:

Gallons	pH	Spec. Cond.	Temp (°F)

Comments:

WELL MONITORING DATA:

Date	Time	Reading	Corr.	Depth	SWL	By
11/22/99	7:00			36.5' bgs		WBL
12/06/99	9:20			36.5' bgs		WBL

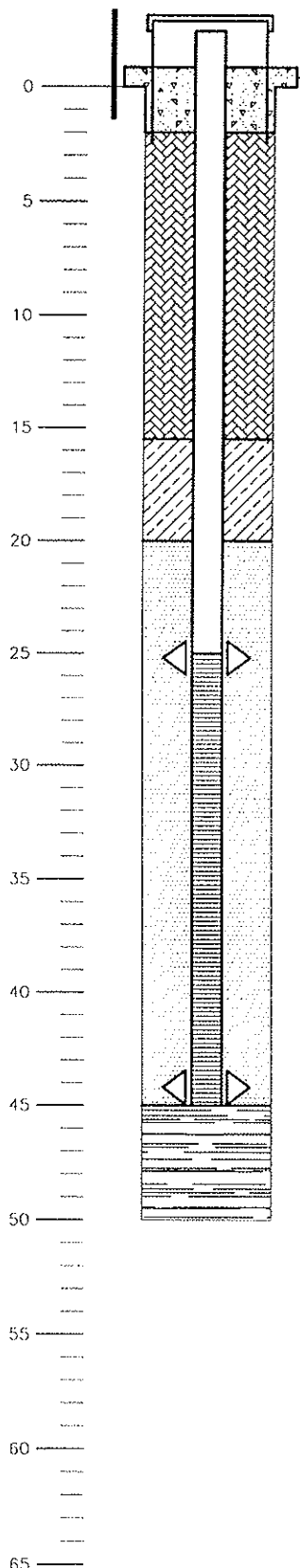
GeoLogic Associates
MONITORING WELL COMPLETION SUMMARY

WELL NO.: GLA-15

PAGE: 1 OF 1

JOB NO.: 9539
PROJECT: DETECTION MONITORING PROGRAM
LOCATION: GREGORY CANYON LANDFILL
INSPECTOR: W. LOPEZ, CEG
CHECKED BY: S. BATTELLE, CHG




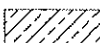


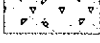
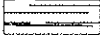
ELEVATION GROUND LEVEL: 304.82
ELEVATION TOP OF CASING: 306.80
DATE STARTED: 11/19/99
DATE FINISHED: 11/20/99
TOTAL DEPTH: 45 feet



DRILLING SUMMARY:

Total Depth: 50 feet
Borehole diameter: 9-7/8"
Driller: Water Development Corporation
Rig: Dresser T-70
Bit(s): Tri-cone
Drilling Fluid: Air
Protective Casing: 9-7/8" ø steel.

WELL CONSTRUCTION DETAILS:

-  **Casing:** 2" diameter Sch. 40 PVC with flush threaded joints. (From +1.98 to 25 feet.)
-  **Screen:** 2" diameter Sch. 40 PVC with 0.020" slots and flush threaded joints. (From 25 to 45 feet.)
-  **Grout Seal:** Portland type I-II neat cement with 5% bentonite. (From 2 to 15.5 feet.)
-  **Bentonite Seal:** Medium bentonite chips. (From 15.5 to 20 feet.)
-  **Filter Pack:** #3 Monterey Sand. (From 20 to 45 feet.)
-  **Centralizer:** Stainless steel. (At 25 and 45 feet.)
-  **Concrete**
-  **Slough**

WELL CONSTRUCTION LOG:

	Date	Start Time	Date	Finish Time
Drilling:	11/19/99	13:10	11/19/99	17:10
Coring:	-	-	-	-
Casing Install:	11/20/99	8:30	11/20/99	8:37
Filter Placement:	11/20/99	8:40	11/20/99	13:00
Seal Placement: (Bentonite Chips)	11/20/99	13:08	11/20/99	13:12
Seal Placement 2nd: (Grout)	11/20/99	14:45	11/20/99	15:20

WELL DEVELOPMENT LOG:

	Date	Start Time	Finish Time
Surge Block			
Air Lift Pumping			
Other -			
Total Gallons Removed:			

STABILIZATION TEST DATA:

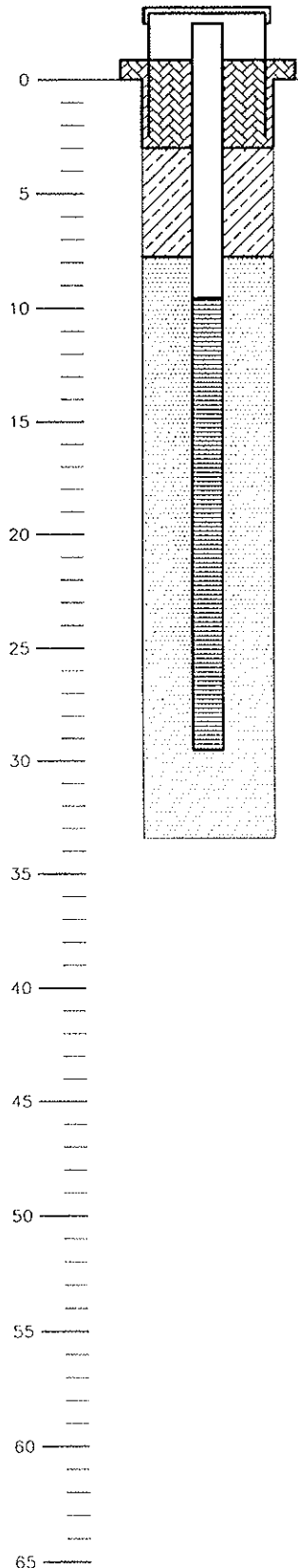
Gallons	pH	Spec. Cond.	Temp (°F)

Comments:

WELL MONITORING DATA:

Date	Time	Reading	Corr.	Depth	SWL	By
11/20/99	7:00			25.0' bgs		WBL
11/21/99	8:30			11.7' bgs		WBL
12/08/99	8:50			12.3' bgs		WBL

ELEVATION GROUND LEVEL: 305.28
ELEVATION TOP OF CASING: 307.54
DATE STARTED: 12/20/99
DATE FINISHED: 12/20/99
TOTAL DEPTH: 29.5 feet



DRILLING SUMMARY:


Total Depth: 33.5 feet
Borehole diameter: 8"


Driller: Water Development Corporation
Rig: CME-95
Bit(s): Hollow Stem Auger

Drilling Fluid: Air


Protective Casing: Hollow Stem Auger

WELL CONSTRUCTION DETAILS:

 Casing: 2" diameter Sch. 40 PVC
with flush threaded joints.
(From +2.26 to 9.5 feet.)

 Screen: 2" diameter Sch. 40 PVC
with 0.020" slots and flush
threaded joints.
(From 9.5 to 29.5 feet.)

 Grout Seal: Readmix concrete.
(From 0 to 3 feet.)

 Bentonite Medium bentonite chips.
Seal: (From 3 to 7.8 feet.)

Filter Pack: #3 Monterey Sand.
(From 7.8 to 33.5 feet.)

WELL CONSTRUCTION LOG:

	Start		Finish	
	Date	Time	Date	Time
Drilling:	12/20/99	10:00	12/20/99	10:15
Coring:	-	-	-	-
Casing Install:	12/20/99	10:15	12/20/99	10:30
Filter Placement:	12/20/99	10:30	12/20/99	10:55
Seal Placement: (Bentonite Chips)	12/20/99	10:55	12/20/99	11:05
Seal Placement 2nd: (Grout)	12/20/99	11:15	12/20/99	11:30

WELL DEVELOPMENT LOG:

	Date	Start Time	Finish Time
Surge Block	12/23/99	11:40	12:10
Air Lift Pumping			
Other - Bailer	12/23/99	12:10	14:00

Total Gallons Removed: 65

STABILIZATION TEST DATA:

[illegible]

Comments:

WELL MONITORING DATA:

Date	Time	Reading	Corr.	Depth	SWL	By
12/20/99	11:10			10.6' bgs		WBL

BORING LOG

BORING NO.: GLA-1

PAGE: 1 OF 5

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: T. REEDER

DATE STARTED: 11/19/96
 DATE FINISHED: 11/20/96
 ELEVATION: ND
 NORTHING: ND
 EASTING: ND

GW DEPTH: 99.5 feet
 TOTAL DEPTH: 300 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USGS GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
11/19 10:12						0				RESIDUAL SOIL mixed with decomposed rock. Yellowish brown (10R5/4). Drills as a coarse SAND. Moderately to highly weathered. Dominant lithic fragments are decomposed LEUCOGRANODIORITE with iron oxide staining.	Dry.
						5					
						10					
						15				Decomposed GRANODIORITE with quartz. Light brownish gray (2.5Y6/2) to brown (10YR5/3). Oxidized with altered biotite and some pink (7.5YR7/4) potassium-feldspar. Cut by quartz feldspar dikes.	Damp.
						20				BONSALL TONALITE. Gray (2.5Y5/1). Drills as a fine to medium sand with some coarse fragments. Highly to moderately weathered; some iron oxide staining; altered micas.	Damp.
						25				...(20') - slightly less weathered (moderately weathered) and more felsic.	
						30				...(30') - TONALITE drills as a fine sand with minor coarse sand - fine gravel size fragments. Color changes to gray (2.5Y6/1).	
						35					
						40					
12:14	10:36					45				GRANODIORITE/TONALITE lithic fragments. Slightly weathered and oxidized. Gray (N6); many fragments display foliation; rare pinkish white (5YR8/2) potassium feldspar, probably as dikes.	
		1.17				50				GRANODIORITE. Increase in felsic lithic fragments. Gray (10YR6/4) to light gray (10YR7/1). More quartz and feldspar dikes; foliation is less common. Iron oxide staining on quartz and feldspar.	
						55				GRANODIORITE/TONALITE. Less felsic fragments. Color change to gray (5Y5/1 to N5); with very minor pinkish white to reddish yellow (5YR8/2 to 7.5YR7/6) potassium feldspar; very minor iron oxide staining.	
12:35	12:31					60					

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The data presented on this log is a simplification of actual conditions encountered and applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change with the passage of time.

BORING LOG

BORING NO.: GLA-1

PAGE: 2 OF 5

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: T. REEDER

DATE STARTED: 11/19/96
 DATE FINISHED: 11/20/96
 ELEVATION: ND
 NORTHING: ND
 EASTING: ND

GW DEPTH: 99.5 feet
 TOTAL DEPTH: 300 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USCS/GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
12:35						60				GRANODIORITE/TONALITE. Less felsic fragments. Color change to gray (5Y5/1 to N5); with very minor pinkish white to reddish yellow (5YR8/2 to 7.5YR7/6) potassium feldspar; very minor iron oxide staining.	
						65				TONALITE. Gray (N6). Slightly weathered. Mineralogy is hornblende, pyroxene, feldspar (plagioclase), and minor quartz.	
						70				...(70') - slightly darker; less potassium feldspar.	
						75					
12:59	12:57	0.91				80					...(80') - dry.
						85					
						90					
		0.91				95				...(95') - mixed TONALITE and GRANODIORITE. Darker gray (N5) and light gray (N7) (TONALITE inclusions in GRANODIORITE?).	
						100					
						105					
						110				...(110') - less segregated GRANODIORITE/TONALITE.	
						115				...(115') - slightly more felsic lithic fragments. GRANODIORITE/TONALITE with slightly oxidized quartz/feldspar dikes.	
		1.05				120				...(120') - More uniform appearance. Felsic fragments absent - no dikes.	
13:46	13:43										

CONTINUED ON NEXT PAGE

The data presented on this log is a simplification of actual conditions encountered and applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change with the passage of time.

BORING LOG

BORING NO.: GLA-1

PAGE: 3 OF 5

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: T. REEDER

DATE STARTED: 11/19/96
 DATE FINISHED: 11/20/96
 ELEVATION: ND
 NORTHING: ND
 EASTING: ND

GW DEPTH: 99.5 feet
 TOTAL DEPTH: 300 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USCS/GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
13:46						120				...(120') - More uniform appearance. Felsic fragments absent - no dikes.	
		0.91				125				...(125') - same as above. GRANODIORITE/TONALITE. Gray (N5). Slight foliation on some fragments.	Dry.
						130				GRANODIORITE/TONALITE. Gray (N5).	
	14:08					135					
14:12						140					
						145					
						150					
						155					
	14:33	0.95				160				...(160') - slightly more felsic fragments, possibly dikes in the TONALITE.	
14:37						165				...(165') - less felsic fragments; more mafics.	
						170					
						175					
	14:56	1.05				180					
15:25											

CONTINUED ON NEXT PAGE

The data presented on this log is a simplification of actual conditions encountered and applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change with the passage of time.

BORING LOG

BORING NO.: GLA-1

PAGE: 4 OF 5

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: T. REEDER

DATE STARTED: 11/19/96
 DATE FINISHED: 11/20/96
 ELEVATION: ND
 NORTHING: ND
 EASTING: ND

GW DEPTH: 99.5 feet
 TOTAL DEPTH: 300 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USGS GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
15:25						180					
						185					
						190				...(190') - some very minor iron oxide staining along fractured surfaces.	
						195					
15:50	15:47	0.91				200				GRANODIORITE/TONALITE. Gray (N5). Slightly weathered to fresh.	
						205				...(205') - increase in felsic minerals (quartz and feldspar); probably GRANODIORITE dikes in the TONALITE. White (N8) felsic fragments represent approximately 35-40% of material.	
						210					...(210') - dampness on outside of drill stem.
						215				...(215') - felsic fragments increase to 50%.	
16:12	16:09	1.05				220				LEUCOGRANODIORITE. White (N8 to 10YR8/1) with minor inclusions of TONALITE. Slightly weathered; minor iron oxide staining; with pinkish white (5YR8/2) potassium feldspar.	
						225				GRANODIORITE/TONALITE with felsic dikes. Gray (N5) TONALITE with approximately 30% LEUCOGRANODIORITE dikes.	...(223') - damp.
						230				...(230') - 5% felsic fragments.	
						235				...(235') - felsic fragments increase to 40%. LEUCOGRANODIORITE dikes in TONALITE. Light gray (N6). Slightly oxidized.	
11/20 7:35	16:30	1.11				240				...(240') - felsic fragments represent approximately 50% of the material (QUARTZ GRANODIORITE?).	

CONTINUED ON NEXT PAGE

The data presented on this log is a simplification of actual conditions encountered and applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change with the passage of time.

BORING LOG

BORING NO.: GLA-1

PAGE: 5 OF 5

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: T. REEDER

DATE STARTED: 11/19/96
 DATE FINISHED: 11/20/96
 ELEVATION: ND
 NORTHING: ND
 EASTING: ND

GW DEPTH: 99.5 feet
 TOTAL DEPTH: 300 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USGS GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
11/20 7:35						240				...(240') - felsic fragments represent approximately 50% of the material (QUARTZ GRANODIORITE?).	
	7:41	0.83				245				...(245') - felsic fragments less than 5% (GRANODIORITE with 30%+ quartz and feldspar). Light gray (N6); with pink (5Y7/4) potassium feldspar; some epidote and chlorite alteration.	Wet.
						250				...(250') - no pink potassium feldspar. Increase in GRANODIORITE/TONALITE fragments foliation.	
						255				...(255') - darker. TONALITE with little felsic fragments. Gray (N5). Very minor quartz/feldspar dikes.	Dry.
	8:08	0.56				260				TONALITE. Dark gray (N5). Hard; minor foliation of mafic minerals.	
						265					...(265') - enough water flowing into the hole to wet sample when adding rod.
	8:17	1.25				270				...(270') - Migmatitic texture on some fragments. GRANODIORITE/TONALITE with minor epidote and chlorite alteration. Slightly more felsic than above.	
						275					
	8:42	0.83				280					
						285				...(285') - white zeolite coating on fracture surface on one lithic fragment. Very minor iron oxide staining on some fragments. Minor chlorite and epidote alteration.	Damp.
						290				...(290') - very minor pinkish white (5Y8/2) potassium feldspar.	
	8:53	0.91				295				...(295') - no visible potassium feldspar (5YR8/2).	
						300				NOTES: 1. Total depth of borehole 300 feet. 2. Conductor casing set to 20 feet. 3. Open hole interval (exposed bedrock) between 20 and 300 feet below ground surface. 4. Groundwater first encountered between 200 and 220 feet. 5. Depth to water on 12/16/96 measured at 37.10 feet.	

The data presented on this log is a simplification of actual conditions encountered and applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change with the passage of time.

BORING LOG

BORING NO.: GLA-2

PAGE: 1 OF 5

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: T. REEDER

DATE STARTED: 11/18/96
 DATE FINISHED: 11/19/96
 ELEVATION: 375 feet
 NORTHING: ND
 EASTING: ND

GW DEPTH: 70 feet
 TOTAL DEPTH: 250 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USCS/GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
11/18 11:20						0			SM	RESIDUAL SOIL. Loose, non-cohesive, with coarse SAND to fine GRAVEL-sized rock fragments. Yellowish-brown (10YR5/4).	Dry.
						5				BONSALL TONALITE. Strongly weathered (probably "C" horizon). Brown (10YR5/3). Drills as a fine silty sand.	Damp.
		0.67				10				...(10') - becomes coarser with fine sand to medium gravel-sized fragments; coarser fragments are dominantly composed of quartz and feldspar (probably derived from a LEUCOGRANODIORITE dike).	
11:42	11:50					20				...(20') - slightly coarser.	Drier.
						25				GRANODIORITE. Gray (2.5Y5/1) to grayish brown (2.5Y5/2). Drills as a loose fine sand with minor coarse sand-size fragments of quartz and feldspar.	Dry.
12:26	12:05	0.87				35				LEUCOGRANODIORITE dike (?). Color changes to light gray (2.5Y7/1) to gray (2.5Y6/1). Drills as a very fine sand; minor coarse sand-size fragments; rare gravel-size fragments. Increase in felsic minerals (quartz and feldspar); decrease in mafics. ... (35'-40') - sample consists only of coarse fragments. Pale red (2.5YR7/2).	Dry. Drilling becomes more difficult from this depth on.
13:25	12:48					40				...(40') - LEUCOGRANODIORITE dike (?). Gray (2.5Y7/1). Very felsic.	Dry.
						45				...(45') - GRANODIORITE. Slightly darker, but still gray (2.5Y7/1).	
						50				...(50') - darker gray (2.5Y6/1). Increase in mafics (biotite).	Dry.
						55				...(55') - slightly darker gray (2.5Y6/1 to 2.5Y5/1). Drills as a very fine sand, with minor coarse sand and medium gravel fragments.	
13:40	13:37	1.67				60				...(60') - iron oxide staining on fragments (probably weathered fracture). Gray (7.5YR5/1).	

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The data presented on this log is a simplification of actual conditions encountered and applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change with the passage of time.

BORING LOG

BORING NO.: GLA-2

PAGE: 2 OF 5

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: T. REEDER

DATE STARTED: 11/18/96
 DATE FINISHED: 11/19/96
 ELEVATION: 375 feet
 NORTHING: ND
 EASTING: ND

GW DEPTH: 70 feet
 TOTAL DEPTH: 250 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USCS/GEOLGIC FORMATION	DESCRIPTION	COMMENTS
13:40						60				...(60') - iron oxide staining on fragments (probably weathered fracture). Gray (7.5YR5/1).	
						65					
						70	12/16/96			GRANODIORITE. Gray (7.5YR5/1). Moderately weathered with iron oxide staining, probably along fractures. Some GRANODIORITE fragments display foliation. ...(70') - less oxidation. GRANODIORITE/TONALITE.	
						75					
14:02	13:58	1.11				80				...(80') - slightly weathered. Very little iron oxide staining. Color change to gray (N6 to N5) with some bluish gray (5B5/1).	
						85				...(85') - less weathered. No iron oxide staining.	
						90					
						95				...(95') - slightly less mafic. Pronounced foliation on many fragments.	
						100					
14:24	14:20	1.11				105					
						110					
						115					
14:44	14:41	1.18				120				GRANODIORITE. Gray (N5). Slightly weathered.	

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BORING LOG

BORING NO.: GLA-2

PAGE: 3 OF 5

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: T. REEDER

DATE STARTED: 11/18/96
 DATE FINISHED: 11/19/96
 ELEVATION: 375 feet
 NORTHING: ND
 EASTING: ND

GW DEPTH: 70 feet
 TOTAL DEPTH: 250 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USGS/GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
14:44						120				GRANODIORITE. Gray (N5). Slightly weathered.	
						125					
						130				GRANODIORITE with minor quartz feldspar dikes. Gray (N5). Slightly weathered.	
						135				...(135') - lighter color; gray (N6) to light gray (N7). Less mafics; more quartz and feldspar.	
15:02						140					...(140') - damp.
						145					
						150					...(150') - moist.
						155					
15:36	15:25	0.87				160					...(160') - possibly moist; will let hole sit 15 minutes to see if water seeps into the hole.
						165					...(165') - wet.
						170					...(170') - drilling dry again; probably very low seepage into hole.
						175					
16:13	15:59	0.87				180					...(180') - moist; will let hole sit 15 minutes before putting in next stem. Refuel.

CONTINUED ON NEXT PAGE

The data presented on this log is a simplification of actual conditions encountered and applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change with the passage of time.

BORING LOG

BORING NO.: GLA-2

PAGE: 4 OF 5

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: T. REEDER

DATE STARTED: 11/18/96
 DATE FINISHED: 11/19/96
 ELEVATION: 375 feet
 NORTHING: ND
 EASTING: ND

GW DEPTH: 70 feet
 TOTAL DEPTH: 250 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USGS GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
16:13						180				...same as above.	...(180') - moist; will let hole sit 15 minutes before putting in next stem. Refuel.
						185					...(181') - wet.
						190					...(185') - damp.
						195				TONALITE. Darker gray (N5 to N4), with white (N8) fragments mixed in composed of quartz and feldspar (probably derived from quartz/feldspar dikes in TONALITE).	
11/19	6:45					200				TONALITE. Gray (N5) to dark gray (N4), with white (N8) fragments of quartz/feldspar mixed in (<10%) (probably derived from quartz/feldspar dikes in TONALITE).	
	6:54					205					
						210				...(210') - pink (5YR8/3) potassium feldspar fragments present in mix. Increase in felsic fragments up to 15-20% of material (TONALITE with feldspathic dikes). Some chlorite alteration of mafics.	
						215				...(215') - decrease in felsic fragments to approximately 5%. No obvious potassium-feldspar fragments.	
	7:18	0.83				220					...(220') - still drilling damp.
	7:24					225					...(223') - very minor water in hole when adding rod.
						230				...(230') - same as above.	Drilling drier to just slightly damp.
						235					...(235') - drilling wet again; driller thinks there is water pressure; material is clogging up cyclone.
	8:04	0.77				240				TONALITE/DIORITE. Mafic fragments are dark gray to very dark gray (N4 to N3) when wet. Less than 3% felsic fragments.	

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The data presented on this log is a simplification of actual conditions encountered and applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change with the passage of time.

BORING LOG

BORING NO.: GLA-2

PAGE: 5 OF 5

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: T. REEDER

DATE STARTED: 11/18/96
 DATE FINISHED: 11/19/96
 ELEVATION: 375 feet
 NORTHING: ND
 EASTING: ND

GW DEPTH: 70 feet
 TOTAL DEPTH: 250 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USGS GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
8:04						240				TONALITE/DIORITE. Mafic fragments are dark gray to very dark gray (N4 to N3) when wet. Less than 3% felsic fragments.	
	8:19	0.67				245					
						250				...(250') - some epidote alteration of plagioclase; some chlorite alteration of mafics.	
						255				NOTES:	
						260				1. Total depth of borehole 250 feet.	
						265				2. Conductor casing set to 10 feet.	
						270				3. Open hole interval (exposed bedrock) between 10 and 250 feet below ground surface.	
						275				4. Groundwater first encountered at 150 feet.	
						280				5. Depth to water on 12/16/96 measured at 69.73 feet.	
						285					
						290					
						295					
						300					

The data presented on this log is a simplification of actual conditions encountered and applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change with the passage of time.

BORING LOG

BORING NO.: GLA-3

PAGE: 1 OF 3

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: T. REEDER

DATE STARTED: 11/25/96
 DATE FINISHED: 11/26/96
 ELEVATION: 330 feet
 NORTHING: ND
 EASTING: ND

GW DEPTH: 21 feet
 TOTAL DEPTH: 150 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USCS/GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
11/25 12:15						0			SM SP	TOPSOIL/COLLUVIUM: SILTY SAND with GRAVEL; sub-angular clasts of TONALITE and LEUCOGRANODIORITE; loose. Dark grayish brown (10YR4/3).	Moist.
						5			SW	ALLUVIUM: SAND, medium- to coarse-grained, minor fines, with fine- to coarse-grained angular gravel-size fragments of mostly LEUCOGRANODIORITE with some TONALITE. Brown (10YR5/3).	...(5') - damp.
						10			SW	SAND with minor fine- to coarse-grained GRAVEL. Light yellowish brown (2.5Y6/4) to very pale brown (2.5Y7/3).	...(10') - damp.
						15			SW		
						20			SW		
						25	12/16/96		SW		
						30			SW	DECOMPOSED LEUCOGRANODIORITE (GRUSS). Light olive brown (2.5Y5/6), highly weathered; Fe-oxide staining. Drills as a fine- to coarse-grained sand/silty sand; soft, loose.	...(30') - damp.
						35			SW	DECOMPOSED LEUCOGRANODIORITE. Olive (5Y5/3) with Fe-oxide staining. Highly weathered and decomposed.	
						40			SW	DECOMPOSED LEUCOGRANODIORITE. Light olive brown (2.5Y5/4). Drills as fine- to coarse-grained sand with minor gravel. Highly weathered and decomposed.	...(40') - damp.
						45			SW	...(45') - color change to olive brown (2.5Y4/4).	
						50			SW	DECOMPOSED LEUCOGRANODIORITE. Pale brown (10YR6/3) to yellowish brown (10YR5/4). Drills as loose, soft, medium- to coarse-grained sand. Potassium feldspar is reddish yellow (7.5YR6/6-6/8) with Fe-oxide staining.	...(50') - damp.
						55			SW	...(60') - cuttings change in color to pale olive (5Y6/3); larger lithic fragments are gray (10YR6/1) to light brownish gray (10YR6/2); decrease in oxidation staining; color intensity of potassium feldspar decreases to pink (7.5YR8/3) to pinkish gray (7.5YR7/2).	
15:33	12:45	2				60			SW		

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The data presented on this log is a simplification of actual conditions encountered and applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change with the passage of time.

BORING LOG

BORING NO.: GLA-3

PAGE: 2 OF 3

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: T. REEDER

DATE STARTED: 11/25/96
 DATE FINISHED: 11/26/96
 ELEVATION: 330 feet
 NORTHING: ND
 EASTING: ND

GW DEPTH: 21 feet
 TOTAL DEPTH: 150 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USGS/GEOLGIC FORMATION	DESCRIPTION	COMMENTS
15:33						60				...(60') - cuttings change in color to pale olive (5Y6/3); larger lithic fragments are gray (10YR6/1) to light brownish gray (10YR6/2); decrease in oxidation staining; color intensity of potassium feldspar decreases to pink (7.5YR8/3) to pinkish gray (7.5YR7/2).	
						65				LEUCOGRANODIORITE. Weathered and decomposed. Cuttings are mixed yellow (10YR7/6) and grayish brown (10YR5/2) with minor reddish yellow (7.5YR7/6) potassium feldspar.	...(65') - groundwater first encountered. Moderately wet.
						70				...(70') - cuttings are light olive brown (2.5Y5/4).	...(70') - damp.
						75				...(75') - cuttings are olive brown (2.5Y4/3).	Hole produces water at a rate of about 15 gpm.
						80					
						85				...(85') - slightly darker, more mafic.	
						90				GRANODIORITE/TONALITE. Composed mostly of plagioclase, quartz and mafics. Slightly weathered. Dark greenish gray (5B4/1); larger lithic fragments are gray (N5); potassium feldspar is reddish yellow (7.5YR6/6). Less than 3% Fe-oxide staining on some quartz and feldspar dikes.	...(90') - moist.
						95					
16:03	16:01	1.43				100				TONALITE. Relatively unweathered. Gray (N5) with little Fe-oxide staining.	
						105					
						110					
						115					
11/26	16:31	0.71				120				...(120') - minor (less than 5%) potassium feldspar.	

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BORING LOG

BORING NO.: GLA-3

PAGE: 3 OF 3

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: T. REEDER

DATE STARTED: 11/25/96
 DATE FINISHED: 11/28/96
 ELEVATION: 330 feet
 NORTHING: ND
 EASTING: ND

GW DEPTH: 21 feet
 TOTAL DEPTH: 150 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USCS/GEOLGIC FORMATION	DESCRIPTION	COMMENTS
11/26						120				...(120') - minor (less than 5%) potassium feldspar.	
						125					
						130				TONALITE. Gray (N5). Slightly weathered with less than 1% feldspar. Minor quartz/feldspar dikes.	
						135					
7:25	7:19	1.67				140				...(140') - color change to dark gray (N4).	
						145					
	7:31					150					
						155				Notes: 1. Total depth of borehole 150 feet. 2. Conductor casing set to 45 feet. 3. Open hole interval (exposed bedrock) between 45 and 150 feet below ground surface. 4. Groundwater first encountered at 65 feet. 5. Depth to water on 12/16/96 measured at 23.84 feet.	

The data presented on this log is a simplification of actual conditions encountered and applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change with the passage of time.

BORING LOG

BORING NO.: GLA-4

PAGE: 1 OF 4

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: T. REEDER / M. VINCENT, CEG

DATE STARTED: 11/26/96
 DATE FINISHED: 11/27/96
 ELEVATION: 905 feet
 NORTHING: ND
 EASTING: ND

GW DEPTH: 103.2 feet
 TOTAL DEPTH: 240 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USGS GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
11/26						0			SM SC	TOPSOIL: SILTY SAND with CLAY to CLAYEY SAND. Reddish brown (5Y3/3) to dark brown (7.5YR3/3), soft, loose. Less than 6" thick.	Moist.
						5			SP	ALLUVIUM: Coarse SAND with fine GRAVEL and angular felsic clasts. Pale yellow (2.5Y7/4) to very pale brown (10YR7/4).	...(0.5') - damp.
						10				TONALITE: Moderately weathered with minor quartz/feldspar dikes.	Damp.
						15				TONALITE with less than 30% of quartz/feldspar dikes. Gray (N5).	
						20				...(20') - increase in felsic cuttings to 50%.	
						25				LEUCOGRANODIORITE DIKE. Yellow (10YR7/6) with Fe-oxide staining. Cuttings are approximately 40% TONALITE and 60% LEUCOGRANODIORITE.	Damp.
						30				LEUCOGRANODIORITE DIKE (30-35%) in TONALITE. Weathered potassium feldspar is pink (5Y7/4). Cuttings are somewhat oxidized.	
						35					
						40				TONALITE. Greenish gray (5GY6/1), phaneritic with fine crystallinity and anhedral to subhedral crystals. Moderately weathered and hydrothermally altered. Hornblende and biotite phenocrysts show moderate chlorite-epidote hydrothermal alteration.	
						45					
						50				...(49') - color change to greenish gray (10BG6/1).	
						55				TONALITE. Bluish gray (10B5/1), phaneritic with fine crystallinity and anhedral to subhedral crystals; biotite- and hornblende-rich. Weak alteration to chlorite-epidote.	
						60				...(61') - slightly higher mafic mineral content than above.	

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BORING LOG

BORING NO.: GLA-4

PAGE: 2 OF 4

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: T. REEDER / M. VINCENT, CEG

DATE STARTED: 11/26/96
 DATE FINISHED: 11/27/96
 ELEVATION: 905 feet
 NORTHING: ND
 EASTING: ND

GW DEPTH: 103.2 feet
 TOTAL DEPTH: 240 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USGS GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
7:27						60				...(61') - Slightly higher content of biotite than above. ...(61'-65') - weak limonite staining on fracture surfaces. Slightly more chloritized biotite than above. ...(65') - weak foliation as evidenced by preferred orientation of biotite crystals.	
						65					
						70					...(70') - dry.
						75				...(72') - slightly more felsic than above, with slight increase in crystal size from fine- to medium-crystallinity feldspar and hornblende phenocrysts. ...(75') - same as above.	
7:51		~0.95				80				...(80') - same as above.	Dry.
						85				...(85') - same as above. ...(86'-92') - fracture zone with minor limonite and pyrolusite mineral coatings on fracture surfaces.	
8:03						90					...(90') - dry.
						95				...(94') - aplite dike(s) consisting mostly of potassium feldspar with minor quartz. ...(95'-100') - minor limonite staining visible on fracture surfaces.	
						100				...(100'-105') - no visible oxidation.	Dry.
						105					...(103.2') - groundwater sounded on 12/02/96.
						110				...(110'-115') light bluish gray (5B8/1), feldspar- and quartz-rich felsic dike(s). ...(116'-120') - no visible dikes. ...(120'-137') - abundant fragments of medium- to coarse-grained potassium-feldspar and minor quartz dike(s). Host rock TONALITE shows evidence of moderate chlorite-epidote hydrothermal alteration. Fractures show possible zeolite veining with minor oxidation staining on non-mineral filled fractures. Host rock TONALITE is bluish gray (5PB5/1), aphanitic to phaneritic (very fine- to fine-crystallinity) with abundant biotite and hornblende.	Dry.
9:22						120					Dry.

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The data presented on this log is a simplification of actual conditions encountered and applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change with the passage of time.

BORING LOG

BORING NO.: GLA-4

PAGE: 3 OF 4

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: T. REEDER / M. VINCENT, CEG

DATE STARTED: 11/26/96
 DATE FINISHED: 11/27/96
 ELEVATION: 905 feet
 NORTHING: ND
 EASTING: ND

GW DEPTH: 103.2 feet
 TOTAL DEPTH: 240 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USCS/GEOLGIC FORMATION	DESCRIPTION	COMMENTS
						120				...(120'-137') - abundant fragments of medium- to coarse-grained potassium-feldspar and minor quartz dike(s). Host rock TONALITE shows evidence of moderate chlorite-epidote hydrothermal alteration. Fractures show possible zeolite veining with minor oxidation staining on non-mineral filled fractures. Host rock TONALITE is bluish gray (5PB5/1), aphanitic to phaneritic (very fine- to fine-crystallinity) with abundant biotite and hornblende.	...(120') - dry.
						125					
						130					
						135					...(130') - dry.
8:08						140					Moderately hard drilling.
						145					Groundwater sounded at 103.2' below ground surface on 12/02/96 at 6:55.
						150					No free groundwater while drilling or stacking rods.
8:24						155					Hard drilling. No free groundwater while drilling or stacking rods.
						160					...(149.93') - groundwater sounded on 12/16/96.
						165					
8:36						170				...(154') - color change to bluish gray to dark bluish gray (10B4.5/1) with increase in felsic mineral content and increase in crystal size to fine- to medium-crystallinity; anhedral to subhedral feldspar crystals. Cuttings show a weak foliation as evidenced by the segregation of mafic and felsic minerals, and by the preferred orientation of biotite crystals. No visible oxidation of fractures. Rock is unfractured to weakly fractured. No chlorite-epidote alteration visible.	Hard to very hard drilling. No free groundwater encountered.
						175					
						180				...(175') - same as above.	Hard to very hard drilling. No free groundwater encountered.
9:10											

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BORING LOG

BORING NO.: GLA-4

PAGE: 4 OF 4

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: T. REEDER / M. VINCENT, CEG

DATE STARTED: 11/26/96
 DATE FINISHED: 11/27/96
 ELEVATION: 905 feet
 NORTHING: ND
 EASTING: ND

GW DEPTH: 103.2 feet
 TOTAL DEPTH: 240 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USGS GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
9:10						180					
						185				...(185') - same as above.	
						190				...(190') - better developed foliation with depth. No visible jointing or fracturing.	Hard to very hard drilling. No free groundwater encountered.
						195				...(195'-240') - same as above.	
9:43						200					Hard to very hard drilling. No free groundwater encountered.
						205					
						210					Hard to very hard drilling. No free groundwater encountered.
						215					
10:23						220					Hard to very hard drilling. No free groundwater encountered.
						225					
						230					Hard to very hard drilling. No free groundwater encountered.
						235					
						240					
	11:08									Notes: 1. Total depth of borehole 240 feet. 2. Conductor casing set to 30 feet. 3. Open hole interval (exposed bedrock) between 30 and 240 feet below ground surface. 4. Groundwater first encountered between 103 and 140 feet. 5. Depth to water on 12/16/96 measured at 149.93 feet.	

The data presented on this log is a simplification of actual conditions encountered and applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change with the passage of time.

BORING LOG

BORING NO.: GLA-5

PAGE: 1 OF 4

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: T. REEDER

DATE STARTED: 11/20/96
 DATE FINISHED: 11/21/96
 ELEVATION: 930 feet
 NORTHING: ND
 EASTING: ND

GW DEPTH: 41 feet
 TOTAL DEPTH: 190 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USCS/GEOLGIC FORMATION	DESCRIPTION	COMMENTS
11/20 11:20						0				COLLUVIUM/RESIDUAL SOIL: SILTY SAND with coarse-grained SAND and fine-grained GRAVEL and minor CLAY; sub-angular sand and gravel size clasts of TONALITE and LEUCOGRANODIORITE. Dark reddish brown (5YR3/3).	Damp.
						5			SM SP		
						10					
						15				WEATHERED TONALITE. Light olive brown (2.5Y5/3). Drills as a medium- to coarse-grained sand. Minor quartz and feldspar dikes.	Damp.
						20					...(20') - damp.
						25				TONALITE. Gray (2.5Y6/1) to light brownish gray (2.5Y6/2). Moderately weathered. Drills as a fine- to coarse-grained sand with minor fine-grained gravel size fragments. Minor quartz/feldspar dikes.	Less damp.
						30					
						35					
						40	11/21/96			TONALITE/QUARTZ DIORITE. Olive (5Y5/3) cuttings, with black (N2.5) and dark gray (N4) lithic fragments. More mafic than above. Drills as a fine-grained sand.	
						45	12/15/96				
						50				...(50'-55') - color change to light brownish gray (2.5Y6/2) to olive gray (5Y6/2).	
						55					
						60				TONALITE. Gray (5Y6/1). Moderately weathered. Less mafic than above.	

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BORING LOG

BORING NO.: GLA-5

PAGE: 2 OF 4

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: T. REEDER

DATE STARTED: 11/20/96
 DATE FINISHED: 11/21/96
 ELEVATION: 930 feet
 NORTHING: ND
 EASTING: ND

GW DEPTH: 41 feet
 TOTAL DEPTH: 190 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USGS GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
11/21	16:24					80				TONALITE. Gray (5Y6/1). Moderately weathered. Less mafic than above.	
						65					
						70					
						75				...(75'-80') - slightly more felsic, gray (2.5Y6/1) TONALITE; cuttings are sand-size with quartz/feldspar fragments.	
11/21	7:35					80				TONALITE/QUARTZ DIORITE. Gray (N5) lithic fragments. More mafic than above; chlorite alteration of mafics.	
						85				...(85'-90') - felsic cuttings increase to 20% (probably indicates quartz/potassium feldspar dikes in the TONALITE/QUARTZ DIORITE). Felsic fragments have pink (5YR7/4) potassium feldspar. Chlorite alteration of mafics in the TONALITE.	
						90					
						95					...(93'-96') - "soft" drilling.
11/21						100				GRANODIORITE. Bluish gray (5B6/1 to 5/1) with minor reddish yellow (5YR7/6); potassium feldspar and quartz cuttings. GRANODIORITE fragments are chloritized. White coatings on some fractures (zeolite?).	...(100') - moist.
						105				...(100') - decrease in felsic cuttings to less than 10%. Majority of cuttings are of TONALITE with granodiorite dikes; some feldspar and chlorite alteration of mafics; gray (N5).	
						110				TONALITE. Gray (N5). Moderate to slightly weathered and fractured.	...(105') - damp.
						115				...(110') - very minor fragments of quartz/feldspar with minor mafics as veins/dikes in TONALITE.	
						120					...(120') - water coming up hole.

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BORING LOG

BORING NO.: GLA-5

PAGE: 3 OF 4

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: T. REEDER

DATE STARTED: 11/20/96
 DATE FINISHED: 11/21/96
 ELEVATION: 930 feet
 NORTHING: ND
 EASTING: ND

GW DEPTH: 41 feet
 TOTAL DEPTH: 190 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USGS GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
7:35						120					...(120') - water coming up hole.
						125					
						130					
						135				TONALITE. Gray (N5). Slightly weathered; fractured. Chlorite alteration of mafics. Less than 1% quartz/feldspar fragments from dikes, and a few rare fragments of zeolite(?) from fracture infilling; minor iron oxide staining.	
						140					
						145					
						150					
						155					
						160					
						165				...(165') - increase in felsic fragments to 40%.	Sample is wet.
9:08	9:07	0.54				170				...(170') - increase in quartz/feldspar dikes. Decrease in chlorite alteration.	Drier.
						175				...(175') - decrease in felsic fragments to less than 10%.	
						180				TONALITE/QUARTZ DIORITE. ...(180') - less than 3% felsic fragments.	

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BORING LOG

BORING NO.: GLA-5

PAGE: 4 OF 4

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: T. REEDER

DATE STARTED: 11/20/96
 DATE FINISHED: 11/21/96
 ELEVATION: 930 feet
 NORTHING: ND
 EASTING: ND

GW DEPTH: 41 feet
 TOTAL DEPTH: 190 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USCS/GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
9:27						180				...(180') - less than 3% felsic fragments.	
	9:47	0.50				185					
						190				...(190') - increase in felsic fragments to 10%.	Lost bit downhole.
						195				Notes:	
						200				1. Total depth of borehole 190 feet.	
						205				2. Conductor casing set to 30 feet.	
						210				3. Open hole interval (exposed bedrock) between 30 and 190 feet below ground surface.	
						215				4. Groundwater first encountered at 100 feet.	
						220				5. Depth to water on 12/16/96 measured at 42.57 feet.	
						225					
						230					
						235					
						240					

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BORING LOG

BORING NO.: GLA-7

PAGE: 1 OF 3

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: T. REEDER

DATE STARTED: 11/21/96
 DATE FINISHED: 11/21/96
 ELEVATION: 403 feet
 NORTHING: ND
 EASTING: ND

GW DEPTH: 50 feet
 TOTAL DEPTH: 160 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USCS/GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
11/21 13:55						0			SM SW	COLLUVIUM: SILTY SAND, coarse-grained; contains fine gravel fragments. Yellowish brown (10YR5/7).	Damp.
						5			SW	SAND (DG?). Light yellowish brown (2.5YR6/4). May be boulder of decomposed leucogranodiorite.	
						10				DECOMPOSED ROCK (TONALITE?): Olive (5Y5/3). Drills as a fine- to medium-grained sand. Oxidized fragments of brownish yellow (10YR6/8) quartz/potassium feldspar.	...(10') - damp.
						15					
						20				TONALITE/DIORITE. Very dark gray (5Y3/1). Sub-angular to subrounded oxidized fragments.	
						25				TONALITE. Gray (N5). Highly weathered and decomposed. Drills as an olive (5Y5/3), fine- to coarse-grained sand.	...(25') - damp.
						30					
						35	12/16/96				
						40				...(40') - color change to olive gray (5Y5/2 to 4/2).	
						45					
						50					...(50') - groundwater encountered.
	14:20					55					
11/22 8:25						60				TONALITE. Olive (5Y4/3). Highly weathered. Drills as a fine- to coarse-grained sand. Large fragments are gray (N5).	...(60') - abundant water coming out of hole on 11/22/96.

CONTINUED ON NEXT PAGE

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BORING LOG

BORING NO.: GLA-7

PAGE: 2 OF 3

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: T. REEDER

DATE STARTED: 11/21/96
 DATE FINISHED: 11/21/96
 ELEVATION: 403 feet
 NORTHING: ND
 EASTING: ND

GW DEPTH: 50 feet
 TOTAL DEPTH: 160 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USGS GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
8:25						60				TONALITE. Olive (5Y4/3). Highly weathered. Drills as a fine- to coarse-grained sand. Large fragments are gray (N5).	...(60') - abundant water coming out of hole on 11/22/96.
						65				...(65') - moderately weathered TONALITE.	...(65') - damp.
8:35	8:31	1.67				70				...(70') - color change to olive gray (5Y4/2). Lithic fragments are larger and appear less weathered.	...(70') - moist.
						75					
						80					
						85				...(85') - approximately 35% of lithic fragments are of white (N8) quartz/feldspar dikes. TONALITE fragments are very dark gray (N3).	...(85') - moist.
						90					
						95					
8:52	8:50	1.33				100				...(100') - color of cuttings change to dark gray (N4). Lithic fragments of TONALITE are very dark gray (N3); less than 5% felsic fragments. Slight weathering.	...(100') - wet.
						105					
						110					
						115				...(115') - color of cuttings changes to very dark gray (N3). TONALITE fragments are very mafic with dark gray (N4) plagioclase (borderline GABBRO). Slightly weathered. Tonalite fragments are black (N2.5).	
9:24	9:21	0.69				120					...(120') - abundant water in hole.

CONTINUED ON NEXT PAGE

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BORING LOG

BORING NO.: GLA-7

PAGE: 3 OF 3

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: T. REEDER

DATE STARTED: 11/21/96
 DATE FINISHED: 11/21/96
 ELEVATION: 403 feet
 NORTHING: ND
 EASTING: ND

GW DEPTH: 50 feet
 TOTAL DEPTH: 160 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USCS/GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
9:24						120				...same as above.	...(120') - abundant water in hole.
						125					
						130					
						135					
9:54	9:49	0.80				140				...(140') - increase in felsics to 40% (probably derived from quartz/feldspar dikes in TONALITE).	
						145				GRANODIORITE. Gray (N6) with pale red (2.5YR7/2) orthoclase feldspars. Olive (5Y4/4) chlorite/epidote alteration of some clasts, particularly along fracture surfaces.	
						150				TONALITE. Dark gray (N4) with less than 5% felsic fragments.	
						155					
	10:21	0.74				160				GRANODIORITE. Gray (N6) with only rare pale red (2.5YR7/2) potassium feldspar.	
						165				Notes: 1. Total depth of borehole 160 feet. 2. Conductor casing set to 30 feet. 3. Open hole interval (exposed bedrock) between 30 and 160 feet below ground surface. 4. Groundwater first encountered at 50 feet. 5. Depth to water on 12/16/96 measured at 34.82 feet.	

The data presented on this log is a simplification of actual conditions encountered and applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change with the passage of time.

BORING LOG

BORING NO.: GLA-8

PAGE: 1 OF 5

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: M. VINCENT, CEG; T. REEDER

DATE STARTED: 11/24/96
 DATE FINISHED: 11/25/96
 ELEVATION: ND
 NORTHING: ND
 EASTING: ND

GW DEPTH: 61 feet
 TOTAL DEPTH: 300 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USCS/GEOLGIC FORMATION	DESCRIPTION	COMMENTS
11/24 9:20						0				WEATHERED BEDROCK - TONALITE. Light yellowish brown (10YR6/4). Phaneritic with fine-crystallinity, amphibole-rich and biotite-rich. Some hydrothermal alteration to chlorite-epidote facies.	
						5				...(6') - color change to light gray (10YR7/1).	
						10				...(10') - color change to gray (2.5Y6/1). Less oxidation of biotite than above.	
						15					Conductor casing set to 15'. Begin drilling 5-inch diameter with downhole carbide button hammer.
						20					
						25				...(24') - color change to gray (5Y6/1) to light olive gray (5Y6/2). Increase in chlorite-epidote alteration products and minor increase in iron-oxide alteration products.	Slightly damp.
						30					
						35					
						40					
11:45						45				UNWEATHERED BEDROCK - TONALITE. Gray (5Y6/1). Phaneritic with fine-crystallinity, subhedral crystals, biotite and hornblende-rich. Pervasive, moderate to weak chlorite-epidote hydrothermal alteration.	
						50					
						55				...(53'-56') - color change to light brownish gray (2.5Y6/2). Increase in jointing/fracturing as evidenced by increase in oxidation products and weathered feldspar phenocrysts.	
						60					
						12/16/96					

CONTINUED ON NEXT PAGE

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BORING LOG

BORING NO.: GLA-8

PAGE: 2 OF 5

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: M. VINCENT, CEG; T. REEDER

DATE STARTED: 11/24/96
 DATE FINISHED: 11/25/96
 ELEVATION: ND
 NORTHING: ND
 EASTING: ND

GW DEPTH: 61 feet
 TOTAL DEPTH: 300 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USGS GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
12:08	12:28					60	11/25/96			...(64') - color change to light yellowish brown (2.5Y6/3.5).	
						65	12/16/96			...(67'-78') - possible weathered joints as evidenced by alternating zones of light yellowish brown (10YR6/4) weathered rock and greenish gray (10BG5/1) unweathered rock. Contains fragments of dark gray (N4) to greenish gray (10BG5/1), micaceous and amphibole-rich TONALITE with fine- to medium-crystallinity phenocrysts of weak red (10R4/3) feldspar.	...(75') - slightly damp.
						70				...(78') - color change to greenish gray (5BG5/1).	
						75				...(81'-86') - TONALITE to GRANODIORITE. Phaneritic with medium crystallinity; subhedral to euhedral, white to light red (2.5YR6.5/8) potassium feldspar phenocrysts. Minor amounts of white to light red (2.5YR6.5/8) 1/32-inch thick mineral vein infilling (zeolite?) on some fracture surfaces. Mineral veins show some reaction with the host rock, as evidenced by epidote alteration envelopes.	...(83') - larger pieces of sample expelled from the cyclone.
						80				...(86') - groundwater encountered in weathered fracture zone. Weathered rock is pale olive (5Y6/3) in color.	...(85') - stop at 12:28 to trip rods out of hole to repair downhole hammer.
						85				...(98') - decrease in amount of weathered fracture zones. Abundant healed fractures showing shear structures in possible hydrothermal (zeolite) mineral veins approximately 1/2-inch thick.	...(86') - groundwater encountered. Mineral vein materials do not appear to react to weak HCl solution.
						90					...(90') - very dry.
						95					
						100					...(100'-105') - somewhat abundant groundwater.
						105					
						110					
						115					
13:26		1.17				120					

CONTINUED ON NEXT PAGE

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BORING LOG

BORING NO.: GLA-8

PAGE: 3 OF 5

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: M. VINCENT, CEG; T. REEDER

DATE STARTED: 11/24/96
 DATE FINISHED: 11/25/96
 ELEVATION: ND
 NORTHING: ND
 EASTING: ND

GW DEPTH: 61 feet
 TOTAL DEPTH: 300 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USGS GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
13:26						120					
						125					
13:38						130				...(128') - increase in mafic minerals with associated color change to brownish gray (10B5/1).	
	13:45					135				...(135'-140') - healed fractures showing shear structures in possible hydrothermal (zeolite) mineral veins approximately 1/2-inch thick. Veins contain 1/32-inch to 1/16-inch diameter TONALITE fragments as inclusions. Vein materials are typically greenish gray (5B66/1) in color with less than 1/64-inch thick iron-oxide and pyrolusite coatings between the vein material and the host-rock.	...(135') - stop drilling at 13:45 to trip out rods due to blockage in the downhole hammer. Begin drilling with tri-cone bit.
14:25						140				...(143') - abundant olive gray to light red (2.5YR5/8), euhedral feldspar phenocrysts. A weak foliation is evidenced by the partial segregation of mafic and felsic minerals and by the preferred orientation of platy feldspar and biotite phenocrysts. No visible signs of mineral veining on fracture surfaces.	
14:42						145				...(150') - minor occurrence of mineral veining along fracture surfaces, along with non-mineralized fractures.	...(145') - stop drilling at 15:10. Trip out rods and replace tri-cone bit with downhole hammer.
	15:10	0.22				150					
						155					
15:44		1.11				160				...(160') - same as above.	
						165				...(165') - same as above.	
						170				...(169') - decrease in the amount of feldspar phenocrysts with light red (2.5YR5/8) coloration. Most phenocrysts are white.	
16:01		1.43				175				...(172') - increase in amount of mineral veining with associated increase in chloritization. Possible fracture zone.	
16:10						180				...(177') - most feldspar phenocrysts are colored light red (2.5YR5/8). ...(180'-185') - decrease in light red colored feldspar phenocrysts and increase in white colored feldspar.	

CONTINUED ON NEXT PAGE

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BORING LOG

BORING NO.: GLA-8

PAGE: 4 OF 5

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: M. VINCENT, CEG; T. REEDER

DATE STARTED: 11/24/96
 DATE FINISHED: 11/25/96
 ELEVATION: ND
 NORTHING: ND
 EASTING: ND

GW DEPTH: 61 feet
 TOTAL DEPTH: 300 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USCS/GEOLGIC FORMATION	DESCRIPTION	COMMENTS
						180				...(180'-185') - decrease in light red colored feldspar phenocrysts and increase in white colored feldspar.	
						185					
						190				...(190') - same as above.	
						195				...(195') - same as above.	
						200					
						205				TONALITE - dark gray (N4), weathered, with some epidote alteration of feldspar, quartz and granodiorite veins.	...(205') - wet.
						210				CONTACT ZONE: mixed TONALITE and LEUCOGRANODIORITE - mineralogy includes: greenish gray (5G6/1), altered plagioclase; pale red (2.5YR7/2) to light red (2.5YR7/6) orthoclase; white (N8) quartz and plagioclase; dark gray (N4) to dark greenish gray (5GY4/1) mafics (pyroxene, hornblende and biotite). Quartz-filled veins in some of the cuttings.	
						215				...(215') - increase to 80% of cuttings of LEUCOGRANODIORITE with potassium-feldspar and some mafics.	
						220				...(220') - equal proportions in cuttings of greenish gray (5G6/1) TONALITE(?) to pale red (2.5YR7/2) LEUCOGRANODIORITE.	
						225				...(225') - mix of dark gray (N4) TONALITE and light red (2.5YR7/2) LEUCOGRANODIORITE.	
						230				...(230') - approximately 70% greenish gray (5G6/1), altered TONALITE and 30% pale red (2.5YR7/2) GRANODIORITE.	
						235				...(235') - cuttings become darker due to increase in dark gray (N4) mafics.	
						240				...(240') - TONALITE is dark gray (N4) with greenish gray (5G6/1), altered plagioclase and dark gray (N4) mafics. Decrease in potassium-feldspar/LEUCOGRANODIORITE fragments to less than 15%.	
11/25	8:14									CONTINUED ON NEXT PAGE	

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BORING LOG

BORING NO.: GLA-8

PAGE: 5 OF 5

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: M. VINCENT, CEG; T. REEDER

DATE STARTED: 11/24/96
 DATE FINISHED: 11/25/96
 ELEVATION: ND
 NORTHING: ND
 EASTING: ND

GW DEPTH: 61 feet
 TOTAL DEPTH: 300 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USGS GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
11/25 8:14						240				...(240') - TONALITE is dark gray (N4) with greenish gray (5G6/1), altered plagioclase and dark gray (N4) mafics. Decrease in potassium-feldspar/LEUCOGRANODIORITE fragments to less than 15%.	
						245				...(245') - increase in LEUCOGRANODIORITE fragments to about 30%; color intensifies to light red (2.5Y7/6).	
						250				...(250') - TONALITE color becomes lighter - gray (N5). Less than 5% LEUCOGRANODIORITE fragments.	
						255				...(255') - same as above, with minor greenish gray (5G6/1 to 5GB6/1), altered (chloritized?) plagioclase.	
	8:35	0.95				260				...(260') - approximately 10% LEUCOGRANODIORITE fragments.	
8:38						265				TONALITE/GRANODIORITE - gray (N5) to dark gray (N4), with some greenish gray (5G6/1), altered (chloritized?) plagioclase, and LEUCOGRANODIORITE dikes with less than 2% pale red (2.5YR7/2) to light red (2.5YR7/6) orthoclase.	
						270				...(265') - mix of LEUCOGRANODIORITE and GRANODIORITE cuttings. Some greenish gray (5G6/1) altered plagioclase.	
						275				...(275') - same as above.	
	8:54	1.25				280				...(280') - orthoclase feldspar/leucogranodiorite fragments decrease to less than 5%.	
						285				...(285') - increase in LEUCOGRANODIORITE fragments to approximately 35%.	
						290				...(300') - decrease in orthoclase feldspar to approximately 15%; increase in greenish gray (5G6/1), altered plagioclase.	
						295				NOTES:	
						300				1. Total depth of borehole 300 feet. 2. Conductor casing set to 15 feet. 3. Open hole interval (exposed bedrock) between 15 and 300 feet below ground surface. 4. Groundwater first encountered at 86 feet. 5. Depth to water on 12/16/96 measured at 62.40 feet.	

The data presented on this log is a simplification of actual conditions encountered and applies only at the location of this boring and at the time of drilling. Subsurface conditions may differ at other locations and may change with the passage of time.

BORING LOG

BORING NO.: GLA-9

PAGE: 1 OF 5

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: T. REEDER

DATE STARTED: 12/05/96
 DATE FINISHED: 12/07/96
 ELEVATION: ND
 NORTHING: ND
 EASTING: ND

GW DEPTH: Not encountered
 TOTAL DEPTH: 300 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USGS GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
						0				DECOMPOSED TONALITE. Olive gray (5Y4/2). Highly weathered and decomposed. Drills as a fine-grained sand to silty sand with coarse-grained sand to fine-grained gravel size fragments.	Drilling on cut - all topsoil removed. Damp.
						5					
						10				LEUCOGRANODIORITE DIKE. Light yellowish brown (2.5Y6/4) to pale yellow (2.5Y7/4). Highly weathered and decomposed. Fe-oxide staining, and oxidation and chloritization of mafics.	Damp.
						15					
						20					
						25				TONALITE. Dark gray (5Y4/1) to very dark gray (5Y3/1). Moderately weathered. Minor Fe-oxide staining; some chloritization of mafics.	Damp.
						30					
						35				...(35') - quartz veins in TONALITE.	
						40				GRANODIORITE dike in TONALITE (about 60% GRANODIORITE). Light gray (2.5Y7/2) to pale yellow (2.5Y7/3). Oxidized; weathered; some epidote alteration of feldspar and chloritization of mafics.	
						45				DIORITE/TONALITE. Black (N2.5) to very dark gray (N3). Slightly to moderately weathered. Altered biotite on some fragments; minor epidote alteration of some feldspars. Cuttings include fragments of GRANODIORITE; oxidized with some epidote and chlorite alteration.	Damp.
						50				...(50') - very minor quartz/feldspar fragments in cuttings.	
						55				GRANODIORITE dike in TONALITE. White (N8) and black (N2.5) mafics. Approximately 30% GRANODIORITE and 70% TONALITE.	
						60				DIORITE/TONALITE. Very dark gray (N3) to black (N2.5) with GRANODIORITE fragments in cuttings. Slightly weathered to fresh. Zeolite(?) and chlorite as fracture infillings; minor disseminated pyrite in veins and in host rock at contact.	

CONTINUED ON NEXT PAGE

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BORING LOG

BORING NO.: GLA-9

PAGE: 2 OF 5

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: T. REEDER

DATE STARTED: 12/05/96
 DATE FINISHED: 12/07/96
 ELEVATION: ND
 NORTHING: ND
 EASTING: ND

GW DEPTH: Not encountered
 TOTAL DEPTH: 300 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USCS/GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
14:22						60				DIORITE/TONALITE. Very dark gray (N3) to black (N2.5) with GRANODIORITE fragments in cuttings. Slightly weathered to fresh. Zeolite(?) and chlorite as fracture infillings; minor disseminated pyrite in veins and in host rock.	
						65				DIORITE. Very dark gray (N3) to black (N2.5). Slightly weathered to fresh; minor chloritization. No quartz/feldspar fragments.	...(65') - damp to dry. Hard drilling.
14:46	14:43	0.95				70					
						75					
						80					
						85					...(85'-90') - very hard drilling. Broke tooth off bit.
						90					
						95					
15:24	15:19	0.61				100				DIORITE. Very dark gray (N3) to black (N2.5) with minor quartz/feldspar veins with some zeolite(?) alteration/infillings along fractures and chloritization.	
						105					
						110					
						115					
						120					

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BORING LOG

BORING NO.: GLA-9

PAGE: 2 OF 5

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: T. REEDER

DATE STARTED: 12/05/96
 DATE FINISHED: 12/07/96
 ELEVATION: ND
 NORTHING: ND
 EASTING: ND

GW DEPTH: Not encountered
 TOTAL DEPTH: 300 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USCS/GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
14:22						60				DIORITE/TONALITE. Very dark gray (N3) to black (N2.5) with GRANODIORITE fragments in cuttings. Slightly weathered to fresh. Zeolite(?) and chlorite as fracture infillings; minor disseminated pyrite in veins and in host rock.	
						65				DIORITE. Very dark gray (N3) to black (N2.5). Slightly weathered to fresh; minor chloritization. No quartz/feldspar fragments.	...(65') - damp to dry. Hard drilling.
						70					
						75					
14:46	14:43	0.95				80					
						85					...(85'-90') - very hard drilling. Broke tooth off bit.
						90					
						95					
15:24	15:19	0.61				100				DIORITE. Very dark gray (N3) to black (N2.5) with minor quartz/feldspar veins with some zeolite(?) alteration/infillings along fractures and chloritization.	
						105					
						110					
						115					
						120					

CONTINUED ON NEXT PAGE

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BORING LOG

BORING NO.: GLA-9

PAGE: 3 OF 5

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: T. REEDER

DATE STARTED: 12/05/96
 DATE FINISHED: 12/07/96
 ELEVATION: ND
 NORTHING: ND
 EASTING: ND

GW DEPTH: Not encountered
 TOTAL DEPTH: 300 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USGS GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
16:02	15:58	0.59				120					
						125				...(125') - no apparent quartz/feldspar dikes.	
						130				DIORITE. Very dark gray (N3) to black (N2.5). Fresh; hard. Quartz/feldspar fragments with altered biotite and some epidote alteration of feldspars. Very minor disseminated pyrite.	Rock is fractured, but very hard - breaking buttons off bit. Dry.
						135				...(135') - no apparent quartz/feldspar fragments.	
12/06 8:20						140					
						145					
						150				DIORITE. Very dark gray (N3) to black (N2.5). Fresh; very hard; mostly unaltered. Very minor quartz/feldspar fragments with some chloritized biotite.	
						155					
	8:46	0.77				160					
						165					
						170					
						175				...(175') - DIORITE with GRANODIORITE/TONALITE dikes. Chlorite alteration, especially along contact of dikes with DIORITE.	
9:20						180				Altered GRANODIORITE and quartz/feldspar dikes in TONALITE. Greenish gray (5G5/1). Chloritization of some fractures, and thin coatings of zeolite(?) along some fracture surfaces.	Dry.

CONTINUED ON NEXT PAGE

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BORING LOG

BORING NO.: GLA-9

PAGE: 4 OF 5

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: T. REEDER

DATE STARTED: 12/05/96
 DATE FINISHED: 12/07/96
 ELEVATION: ND
 NORTHING: ND
 EASTING: ND

GW DEPTH: Not encountered
 TOTAL DEPTH: 300 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USGS/GEOLGIC FORMATION	DESCRIPTION	COMMENTS
9:20						180				Altered GRANODIORITE and quartz/feldspar dikes in TONALITE. Greenish gray (5G5/1). Chloritization of some fractures, and thin coatings of zeolite(?) along some fracture surfaces.	Dry.
						185				...(185') - TONALITE without felsic fragments.	
						190				...(190') - more mafic - DIORITE.	
						195				...(195') - minor quartz/feldspar fragments in cuttings.	
10:22	9:46	0.77				200				...(200') - DIORITE/TONALITE. Dark gray (N4); increase in felsic fragments in cuttings.	Wait 20 minutes for water. No water.
						205					
						210				...(210') - minor quartz/feldspar fragments in cuttings.	
						215				...(215') - some chloritized fragments - look like fracture coatings; very dark gray (N3).	
10:51	10:47	0.80				220				TONALITE/DIORITE. Very dark gray (N3). Hard; fresh. Very minor granodiorite fragments with some disseminated pyrite(?).	
						225				...(225') - some chloritized fragments, dark greenish gray (5G4/1 to 5BG4/1).	
						230				...(230') - DIORITE. Dark gray (N4) to gray (N5). Less mafics.	
						235					
11:20	11:15	0.83				240					

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BORING LOG

BORING NO.: GLA-9

PAGE: 5 OF 5

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: T. REEDER

DATE STARTED: 12/05/96
 DATE FINISHED: 12/07/96
 ELEVATION: ND
 NORTHING: ND
 EASTING: ND

GW DEPTH: Not encountered
 TOTAL DEPTH: 300 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USGS GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
11:20						240					
	11:35	0.67				245					
14:27						250				...(250') - cuttings are very dark gray (N3) to gray (N4); minor quartz/feldspar fragments.	Changing bit. Fuel up. Let hole sit over one hour - end of sounder is moist, but no free water in hole.
						255				...(255') - DIORITE with no apparent quartz/feldspar dikes. More mafic; darker.	
14:53	14:48	0.48				260					
						265					
						270				...(270') - very minor quartz/feldspar fragments in cuttings.	
						275					
	15:50	0.35				280					Change bit.
12/07 8:30						285				TONALITE. Minor quartz/feldspar dikes with chloritized mafics along contact with TONALITE.	About 0.5" of water at bottom of hole on 12/07 (condensation?).
						290				TONALITE/GABBRO. Very dark gray (N3). Fresh; hard; tight. Minor quartz/feldspar dikes. Minor chloritization of some mafics.	Used up 4 bits (last one only made it 20 feet) - too many carbide fragments in hole. Rubber fitting on bit broke.
						295					
	8:57	0.74				300				NOTES: 1. Total depth of borehole 300 feet. 2. Conductor casing set to 30 feet. 3. Open hole interval (exposed bedrock) between 20 and 300 feet below ground surface. 4. No free groundwater encountered.	

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BORING LOG

BORING NO.: GLA-10

PAGE: 1 OF 3

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: M. VINCENT, CEG / T. REEDER

DATE STARTED: 12/03/96
 DATE FINISHED: 12/05/96
 ELEVATION: 325 feet
 NORTHING: ND
 EASTING: ND

GW DEPTH: 33 feet
 TOTAL DEPTH: 150 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USCS/GEOLGIC FORMATION	DESCRIPTION	COMMENTS
12/03 11:57						0				ALLUVIUM: SAND to SILTY SAND - very fine- to medium-grained with minor coarse sand to pebbles, with boulders of granodiorite and lesser amounts of tonalite. SAND is poorly sorted, micaceous and feldspathic. Dark brown (7.5YR3/3.5).	Dry to damp.
						5			SW SM		
						10				...(10'-20') - gradational color change to pinkish gray to brown (7.5YR5/2) with associated decrease in silt and micaceous minerals.	...(10') - dry to damp.
						15					...(15') - dry to damp.
						20					...(17') - groundwater encountered.
						25			SW	GRAVELLY SAND - poorly sorted, medium- to very coarse-grained, arkosic. Abundant subrounded to sub-angular, tonalitic and granodioritic GRAVEL to BOULDERS.	...(25') - stop drilling to repair rig at 12:16. Start drilling again at 12:35.
12:35	12:16	1.32				30					
						35				WEATHERED BEDROCK - TONALITE: Dark gray (2.5Y4/1) to dark grayish brown (2.5Y4/2). Phaneritic with fine- to medium- crystallinity. Biotite- and hornblende-rich. Weakly weathered with moderate to strong oxidation of biotite and hornblende to chlorite, and with minor alteration of feldspar crystals to clay.	...(33') - wet.
						40					...(40') - wet.
						45				...(45'-50') - predominantly fine- crystallinity.	...(45') - damp.
						50					...(50') - moist to dry. Set conductor casing to 50' below ground surface.
						55				...(53') - color change to olive gray (5Y5/2).	...(55') - dry.
						60					...(60') - dry.

CONTINUED ON NEXT PAGE

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BORING LOG

BORING NO.: GLA-10

PAGE: 2 OF 3

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: M. VINCENT, CEG / T. REEDER

DATE STARTED: 12/03/96
 DATE FINISHED: 12/05/96
 ELEVATION: 325 feet
 NORTHING: ND
 EASTING: ND

GW DEPTH: 33 feet
 TOTAL DEPTH: 150 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USGS GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
						60				...(62') - color change to dark greenish gray (10Y4/1).	...(60') - dry.
						65					
						70				...(70') - color change to pale olive to olive (5Y5.5/3).	
						75				...(73') - color change to greenish gray (5GY5.5/1).	
						80				...(77') - color change to gray (N5).	
12/05 8:54	13:04					85				TONALITE/DIORITE. Very dark gray (N3). Weathered and moderately decomposed. Fe-oxide stained with altered mica and/or pyrite on oxidized pieces; chloritization of some mafics.	...(80') - stop drilling to set conductor casing to 50' below ground surface.
						90				GRANODIORITE dikes in TONALITE. White (N8). Contains black (N2.5) mafic minerals (biotite, hornblende and pyroxene). Very slight chloritization of some mafics (pyroxene) in very dark gray (N3), weathered and moderately decomposed TONALITE.	...(87') - water production from borehole while drilling approximately 5-6 gpm.
						95				...(95') - less than 10% GRANODIORITE dike fragments in TONALITE.	...(90') - wet.
9:27	9:25	0.65				100				...(100') - 40% GRANODIORITE in TONALITE.	
						105				...(105') - dark gray (N4) mixed TONALITE and GRANODIORITE.	Moist.
						110				Gray (N5 to N6) GRANODIORITE.	
						115				Gray (N5 to N6) GRANODIORITE/TONALITE.	...(115') - wet.
10:05	10:02	0.57				120				...(120') - same as above.	Wet.

CONTINUED ON NEXT PAGE

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BORING LOG

BORING NO.: GLA-10

PAGE: 3 OF 3

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON
 DRILLING METHOD: DUAL-WALL REVERSE, AIR
 CONTRACTOR: LAYNE - ENVIRONMENTAL
 LOGGED BY: M. VINCENT, CEG / T. REEDER

DATE STARTED: 12/03/96
 DATE FINISHED: 12/05/96
 ELEVATION: 325 feet
 NORTHING: ND
 EASTING: ND

GW DEPTH: 33 feet
 TOTAL DEPTH: 150 feet

TIME START	TIME STOP	RATE, FT/MIN	WATER SAMPLE INTERVAL	SAMPLE SIZE, INCHES	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USGS/GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
10:05						120				...(120') - same as above.	Wet.
						125				...(125') - less than 5% orthoclase feldspar.	
						130				...(130') - no potassium-feldspar; less than 5% GRANODIORITE dikes in TONALITE.	
						135				...(135') - increase in GRANODIORITE to approximately 50% of cuttings; moderately weathered, with minor pink potassium-feldspar.	
10:47	10:44	0.51				140				...(140') - moderately weathered TONALITE with GRANODIORITE dikes.	
						145				Gray (N6), moderately weathered TONALITE/GRANODIORITE with some epidote/chlorite alteration.	...(145') - wet.
	11:06	0.53				150				...(150') - less than 1% epidote or zeolite alteration and fracture infillings.	
						155				Notes: 1. Total depth of borehole 150 feet. 2. Conductor casing set to 50 feet. 3. Open hole interval (exposed bedrock) between 50 and 150 feet below ground surface. 4. Groundwater first encountered at 33 feet. 5. Depth to water on 12/16/96 measured at 22.20 feet.	

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GeoLogic Associates

Boring Log

BORING NO.: GLA-11

PAGE: 1 OF 5

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON LANDFILL
 DRILLING METHOD: AIR ROTARY
 CONTRACTOR: WATER DEVELOPMENT CORPORATION
 LOGGED BY: W. LOPEZ, CEG

DATE STARTED: 11/30/99
 DATE FINISHED: 11/30/99
 ELEVATION: 775.22
 NORTHING: 2070002.607
 EASTING: 6300855.954

GW DEPTH: 231 feet
 TOTAL DEPTH: 243 feet

TIME	DRY DENSITY (LBS/CU. FT.)	MOISTURE (%)	BLOWS (COUNT/FT.)	SAMPLE SIZE (INCHES)	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USCS/GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
8:20						0		SM/ ML		SOIL: Strong brown (7.5YR5/6) SILTY SAND to SANDY SILT with CLAY. SAND is fine- to medium-grained and moderately graded.	Dry.
						5				WEATHERED BEDROCK: Olive gray (5Y5/2), phaneritic, fine-grained, moderately weathered and oxidized HORNFELS.	
8:42						10					
8:46						15					
						20					
						25					
						30				...(28') - color grades to gray 5Y5/1.	
						35					
						40					
8:55						45					
9:03						50				UNWEATHERED BEDROCK: Dark gray (N4), phaneritic, fine-grained, subhedral, hornblend rich HORNFELS.	Dry.

CONTINUED ON NEXT PAGE

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GeoLogic Associates

Boring Log

BORING NO.: GLA-11

PAGE: 2 OF 5

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON LANDFILL
 DRILLING METHOD: AIR ROTARY
 CONTRACTOR: WATER DEVELOPMENT CORPORATION
 LOGGED BY: W. LOPEZ, CEG

DATE STARTED: 11/30/99
 DATE FINISHED: 11/30/99
 ELEVATION: 775.22
 NORTHING: 2070002.607
 EASTING: 6300855.954

GW DEPTH: 231 feet
 TOTAL DEPTH: 243 feet

TIME	DRY DENSITY (LBS/CU. FT.)	MOISTURE (%)	BLOWS (COUNT/FT.)	SAMPLE SIZE (INCHES)	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USGS/GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
9:25						50				UNWEATHERED BEDROCK: Dark gray (N4), phaneritic, fine-grained, subhedrol, hornblend rich HORNFELS.	Dry.
9:29						55					
						60					
						65					
						70				...(70'-80') -- moderately weathered.	
						75					
9:50						80					
9:55						85					
						90					
						95					
						100				Strong brown (7.5YR5/8) to white (7.5YR8/1), phaneritic, fine- to coarse-grained, moderately weathered, subhedrol to euhedral GRANODIORITE dikes in HORNFELS with potassium feldspar phenocrysts.	Dry.

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GeoLogic Associates

Boring Log

BORING NO.: GLA-11

PAGE: 3 OF 5

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON LANDFILL
 DRILLING METHOD: AIR ROTARY
 CONTRACTOR: WATER DEVELOPMENT CORPORATION
 LOGGED BY: W. LOPEZ, CEG

DATE STARTED: 11/30/99
 DATE FINISHED: 11/30/99
 ELEVATION: 775.22
 NORTHING: 2070002.607
 EASTING: 6300855.954

GW DEPTH: 231 feet
 TOTAL DEPTH: 243 feet

TIME	DRY DENSITY (LBS/CU. FT.)	MOISTURE (%)	BLOWS (COUNT/FT.)	SAMPLE SIZE (INCHES)	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USCS/GEOLGIC FORMATION	DESCRIPTION	COMMENTS
10:22						100				Strong brown (7.5YR5/8) to white (7.5YR8/1),	Dry.
10:28						105				phaneritic, fine- to coarse-grained, moderately	
						110				weathered, subhedral to euhedral GRANODIORITE	
						115				dikes in HORNFELS with potassium feldspar	
						120				phenocrysts.	
11:00						125				HORNFELS with minor GRANODIORITE dikes.	Dry.
11:05						130					
						135					
						140					
11:37						145				...(141'-144') - GRANODIORITE dike.	
11:45						150				...(150') - predominantly mafic with no dikes.	Dry.

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GeoLogic Associates

Boring Log

BORING NO.: GLA-11

PAGE: 4 OF 5

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON LANDFILL
 DRILLING METHOD: AIR ROTARY
 CONTRACTOR: WATER DEVELOPMENT CORPORATION
 LOGGED BY: W. LOPEZ, CEG

DATE STARTED: 11/30/99
 DATE FINISHED: 11/30/99
 ELEVATION: 775.22
 NORTHING: 2070002.607
 EASTING: 6300855.954

GW DEPTH: 231 feet
 TOTAL DEPTH: 243 feet

TIME	DRY DENSITY (LBS/CU. FT.)	MOISTURE (%)	BLOWS (COUNT/FT.)	SAMPLE SIZE (INCHES)	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USCS/GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
12:22						150				...(150') - predominantly mafic with no dikes.	Dry.
12:26						155					
						160					
						165					
						170					Dry.
						175					
						180					
13:04						185					
13:10						190				...(189'-191') - GRANODIORITE dike.	
						195					
						200					Dry.

CONTINUED ON NEXT PAGE

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GeoLogic Associates

Boring Log

BORING NO.: GLA-11

PAGE: 5 OF 5

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON LANDFILL
 DRILLING METHOD: AIR ROTARY
 CONTRACTOR: WATER DEVELOPMENT CORPORATION
 LOGGED BY: W. LOPEZ, CEG

DATE STARTED: 11/30/99
 DATE FINISHED: 11/30/99
 ELEVATION: 775.22
 NORTHING: 2070002.607
 EASTING: 6300855.954

GW DEPTH: 231 feet
 TOTAL DEPTH: 243 feet

TIME	DRY DENSITY (LBS/CU. FT.)	MOISTURE (%)	BLOWS (COUNT/FT.)	SAMPLE SIZE (INCHES)	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USCS/GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
13:47						200				...same as above.	Dry.
13:51						205					
						210					
						215					
						220					
14:28						225					
15:03						230					Wait 30 minutes. Obstruction encountered at 158'. Tape is wet at 75'. Free groundwater encountered when drilling resumed.
						235					
						240					
15:27											Blow out water. Wait 10 minutes; borehole still produces water.
						245				Notes: 1. Total depth of boring 243 feet. 2. Groundwater first encountered at 231 feet. 3. Monitoring well constructed on 12/2/99 (see Monitoring Well Completion Summary).	
						250					

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GeoLogic Associates

Boring Log

BORING NO.: GLA-12

PAGE: 1 OF 2

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON LANDFILL
 DRILLING METHOD: AIR ROTARY
 CONTRACTOR: WATER DEVELOPMENT CORPORATION
 LOGGED BY: W. LOPEZ, CEG

DATE STARTED: 11/24/99
 DATE FINISHED: 11/24/99
 ELEVATION: 343.91
 NORTHING: 2070784.338
 EASTING: 6299410.816

GW DEPTH: 36.7 feet
 TOTAL DEPTH: 66.0 feet

TIME	DRY DENSITY (LBS/CU. FT.)	MOISTURE (%)	BLOWS (COUNT/FT.)	SAMPLE SIZE (INCHES)	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USCS/GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
8:16						0			SM/ ML	SOIL: Strong brown (7.5YR4/6) SILTY SAND to SANDY SILT with CLAY. SAND is fine-grained and poorly graded.	Dry.
						5				WEATHERED BEDROCK: Strong brown (7.5YR4/4), fine-grained GRANODIORITE (GRUSS) weathered with iron- oxide staining and alteration of feldspar crystals to clay.	Damp.
8:38						10					
8:57						15					
						20				Yellowish brown (10YR5/4) to brownish yellow (10YR6/6), phaneritic, fine- to medium- grained, moderately weathered and oxidized GRANODIORITE.	Damp. Switched from tri-cone bit to downhole hammer. Conductor casing set to 18'.
						25				...(23') - gradational color change to pale yellow (5Y7/3).	
						30					
						35				UNWEATHERED BEDROCK: Pale yellow (5Y7/3), phaneritic, fine to coarse subhedral to euhedral GRANODIORITE with white to light red (2.5YR7/6) potassium feldspar phenocrysts.	Moist.
9:30						40					
10:18						45					Wait 45 minutes. Sound for water. Groundwater encountered at 38 feet.
						50				...(48') - color change to light olive brown (2.5Y4/3). ...some as above.	Very moist. Very moist.

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GeoLogic Associates

Boring Log

BORING NO.: GLA-12

PAGE: 2 OF 2

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON LANDFILL
 DRILLING METHOD: AIR ROTARY
 CONTRACTOR: WATER DEVELOPMENT CORPORATION
 LOGGED BY: W. LOPEZ, CEG

DATE STARTED: 11/24/99
 DATE FINISHED: 11/24/99
 ELEVATION: 343.91
 NORTHING: 2070784.338
 EASTING: 6299410.816

GW DEPTH: 36.7 feet
 TOTAL DEPTH: 66.0 feet

TIME	DRY DENSITY (LBS/CU. FT.)	MOISTURE (%)	BLOWS (COUNT/FT.)	SAMPLE SIZE (INCHES)	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USCS/GEOLGIC FORMATION	DESCRIPTION	COMMENTS
10:38						50				...some as above.	Very moist.
						55					
						60					
						65					Wait 2 hours. Sound for water. Groundwater sounded at 36.7 feet.
						70				Notes: 1. Total depth of boring 66 feet. 2. Groundwater first encountered at 38 feet. Static water level measured at 36.7 feet. 3. Monitoring well constructed on 11/24/99 (see Monitoring Well Completion Summary).	
						75					
						80					
						85					
						90					
						95					
						100					

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GeoLogic Associates

Boring Log

BORING NO.: GLA-13

PAGE: 1 OF 2

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON LANDFILL
 DRILLING METHOD: AIR ROTARY
 CONTRACTOR: WATER DEVELOPMENT CORPORATION
 LOGGED BY: W. LOPEZ, CEG

DATE STARTED: 11/22/99
 DATE FINISHED: 11/23/99
 ELEVATION: 355.90
 NORTHING: 2070269.329
 EASTING: 6298912.906

GW DEPTH: 49.7 feet
 TOTAL DEPTH: 69.5 feet

TIME	DRY DENSITY (LBS/CU. FT.)	MOISTURE (%)	BLOWS (COUNT/FT.)	SAMPLE SIZE (INCHES)	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USCS/GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
15:00						0			SM/ ML	SOIL: Light yellowish brown (10YR6/4) SILTY SAND to SANDY SILT. SAND is fine-grained and poorly graded.	Dry.
						5				WEATHERED BEDROCK: Strong brown (7.5YR5/8 to 7.5YR4/6), fine- grained TONALITE (GRUSS). Weathered with Fe- oxide staining and alteration of feldspar crystals to clay.	Domp.
15:17						10					
15:26						15					
						20					Switched from tri-cone to button bit.
						25				Olive (5Y5/3) to olive gray (5Y5/2), phaneritic, hornblend- and quartz-rich fine- to coarse-grained TONALITE with strong oxidation of hornblend and biotite phenocrysts.	Domp.
						30				...(30') - color grades to gray (5Y6/1).	
						35					
15:43						40					
15:46						45					Domp.
						50				UNWEATHERED BEDROCK: Dark gray (5Y4/1) to white (5Y8/1), phaneritic, fine- to coarse-grained TONALITE to GRANODIORITE with abundant felsic minerals with lesser mafic minerals. Shows minor effects of iron-oxide staining.	Moist.

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GeoLogic Associates

Boring Log

BORING NO.: GLA-13

PAGE: 2 OF 2

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON LANDFILL
 DRILLING METHOD: AIR ROTARY
 CONTRACTOR: WATER DEVELOPMENT CORPORATION
 LOGGED BY: W. LOPEZ, CEG

DATE STARTED: 11/22/99
 DATE FINISHED: 11/23/99
 ELEVATION: 355.90
 NORTHING: 2070269.329
 EASTING: 6298912.906

GW DEPTH: 49.7 feet
 TOTAL DEPTH: 69.5 feet

TIME	DRY DENSITY (LBS/CU. FT.)	MOISTURE (%)	BLOWS (COUNT/FT.)	SAMPLE SIZE (INCHES)	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USCS/GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
16:04						50				UNWEATHERED BEDROCK: Dark gray (5Y4/1) to white (5Y8/1), phaneritic, fine- to coarse-grained TONALITE to GRANODIORITE with abundant felsic minerals with lesser mafic minerals. Shows minor effects of iron-oxide staining.	Moist.
11/23						55					
7:46						60					Wait 20 minutes. Sound for water. Groundwater encountered at 58 feet and rising.
8:22						65					Very hard drilling. Water enters borehole while drilling.
						70				Notes: 1. Total depth of boring 69.5 feet. 2. Groundwater first encountered at 58 feet. Static water level measured at 49.7 feet. 3. Monitoring well constructed on 11/23/99 (see Monitoring Well Completion Summary).	
						75					
						80					
						85					
						90					
						95					
						100					

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GeoLogic Associates

Boring Log

BORING NO.: GLA-14

PAGE: 1 OF 2

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON LANDFILL
 DRILLING METHOD: AIR ROTARY
 CONTRACTOR: WATER DEVELOPMENT CORPORATION
 LOGGED BY: W. LOPEZ, CEG

DATE STARTED: 11/21/99
 DATE FINISHED: 11/21/99
 ELEVATION: 332.21
 NORTHING: 2069847.129
 EASTING: 6298115.681

GW DEPTH: 36.5 feet
 TOTAL DEPTH: 63 feet

TIME	DRY DENSITY (LBS/CU FT.)	MOISTURE (%)	BLOWS (COUNT/FT.)	SAMPLE SIZE (INCHES)	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USGS GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
7:35						0			SM/ML	SOIL: Dark yellowish brown (10YR4/4) SILTY SAND to SANDY SILT with CLAY. SAND is fine-grained and poorly graded.	Dry.
7:47						5					
7:53						10					
8:08						15				WEATHERED BEDROCK: Strong brown (7.5YR5/8), fine-grained TONALITE (GRUSS) weathered with iron-oxide staining and alteration of feldspar crystals to clay.	Damp.
8:13						20				Light olive gray (5Y6/2) to gray (5Y5/1), phaneritic, fine- to coarse-grained, hornblende and quartz rich TONALITE with oxidation of hornblende and biotite phenocrysts. ...(20'-22') - white (5Y8/1), unweathered GRANODIORITE dike composed of predominantly quartz and feldspar phenocrysts.	Hard drilling.
8:33						25					
8:48						30					
10:30						35					
15:00						40					
15:45						45					
15:20						50				UNWEATHERED BEDROCK: Dark gray (5Y4/1), phaneritic, subhedral, fine-grained, biotite- and hornblende-rich TONALITE.	Groundwater air lifted out of boring while drilling.

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GeoLogic Associates

Boring Log

BORING NO.: GLA-14

PAGE: 2 OF 2

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON LANDFILL
 DRILLING METHOD: AIR ROTARY
 CONTRACTOR: WATER DEVELOPMENT CORPORATION
 LOGGED BY: W. LOPEZ, CEG

DATE STARTED: 11/21/99
 DATE FINISHED: 11/21/99
 ELEVATION: 332.21
 NORTHING: 2069847.129
 EASTING: 6298115.681

GW DEPTH: 36.5 feet
 TOTAL DEPTH: 63 feet

TIME	DRY DENSITY (LBS/CU. FT.)	MOISTURE (%)	BLOWS (COUNT/FT.)	SAMPLE SIZE (INCHES)	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USCS/GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
15:52						50				UNWEATHERED BEDROCK: Dark gray (5Y4/1), phaneritic, subhedral, fine-grained, biotite- and hornblend-rich TONALITE.	Groundwater air lifted out of boring while drilling.
						55					
						60					
16:15											
						65				Notes: 1. Total depth of boring 63 feet. 2. Groundwater first encountered at 42 feet. Static water level measured at 36.5 feet. 3. Monitoring well constructed on 11/22/99 (see Monitoring Well Completion Summary).	
						70					
						75					
						80					
						85					
						90					
						95					
						100					

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GeoLogic Associates

Boring Log

BORING NO.: GLA-15

PAGE: 1 OF 1

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON LANDFILL
 DRILLING METHOD: AIR ROTARY
 CONTRACTOR: WATER DEVELOPMENT CORPORATION
 LOGGED BY: W. LOPEZ, CEG

DATE STARTED: 11/19/99
 DATE FINISHED: 11/19/99
 ELEVATION: 304.82
 NORTHING: 2068403.283
 EASTING: 6297080.768

GW DEPTH: 12 feet
 TOTAL DEPTH: 50 feet

TIME	DRY DENSITY (LBS/CU. FT.)	MOISTURE (%)	BLOWS (COUNT/FT.)	SAMPLE SIZE (INCHES)	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USCS/GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
13:10						0			SM/ ML	ALLUVIUM: Light olive brown (2.5Y5/3) SILTY SAND to SANDY SILT. SAND is very fine-grained, poorly graded and micaceous.	Dry.
13:20						5			SM	Dark grayish brown (2.5Y4/2), poorly graded, fine- with trace of medium-grained, micaceous SILTY SAND.	Moist.
13:34						10					Very moist.
13:47						15				...(15') - SAND grades to fine- to medium- grained.	Slightly wet.
13:53						20					
						25				...(25') - groundwater first encountered.	
						30					Slightly wet.
14:15						35				...(35') - contains trace amounts of coarse- grained SAND and GRAVEL.	Groundwater air lifted out of borehole while drilling.
16:50						40					
						45					
17:10						50				Notes: 1. Total depth of boring 50 feet. 2. Groundwater first encountered at 25 feet. Static water level measured at 12 feet. 3. Monitoring well constructed on 11/20/99 (see Monitoring Well Completion Summary).	

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GeoLogic Associates

Boring Log

BORING NO.: GLA-16

PAGE: 1 OF 1

JOB NO.: 9539
 SITE LOCATION: GREGORY CANYON LANDFILL
 DRILLING METHOD: HOLLOW STEM AUGER - 8"
 CONTRACTOR: WATER DEVELOPMENT CORPORATION
 LOGGED BY: W. LOPEZ, CEG

DATE STARTED: 12/20/99
 DATE FINISHED: 12/20/99
 ELEVATION: 305.28
 NORTHING: 2068429.193
 EASTING: 6297089.329

GW DEPTH: 10.6 feet
 TOTAL DEPTH: 33.5 feet

TIME	DRY DENSITY (LBS/CU. FT.)	MOISTURE (%)	BLOWS (COUNT/FT.)	SAMPLE SIZE (INCHES)	SAMPLE NO.	DEPTH IN FEET	ELEVATION IN FEET	MATERIAL SYMBOL	USCS/GEOLOGIC FORMATION	DESCRIPTION	COMMENTS
10:00						0			SM/ ML	ALLUVIUM: Light olive brown (2.5Y5/3) SILTY SAND to SANDY SILT. SAND is very fine-grained, poorly graded and micaceous.	Dry.
						5			SM	Dark grayish brown (2.5Y4/2), poorly graded, fine- with trace of medium-grained, micaceous SILTY SAND.	Moist.
						10					Slightly wet. ...(10.6') - groundwater first encountered.
10:15						35				Notes: 1. Total depth of boring 33.5 feet. 2. Groundwater first encountered at 10.6 feet. 3. Monitoring well constructed on 12/20/99 (see Monitoring Well Completion Summary).	

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